



Synar 2017 (FFY 2018) Report

Synar Inspection Study and Electronic Nicotine Delivery System (ENDS) Pilot Study

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ABOUT THIS REPORT

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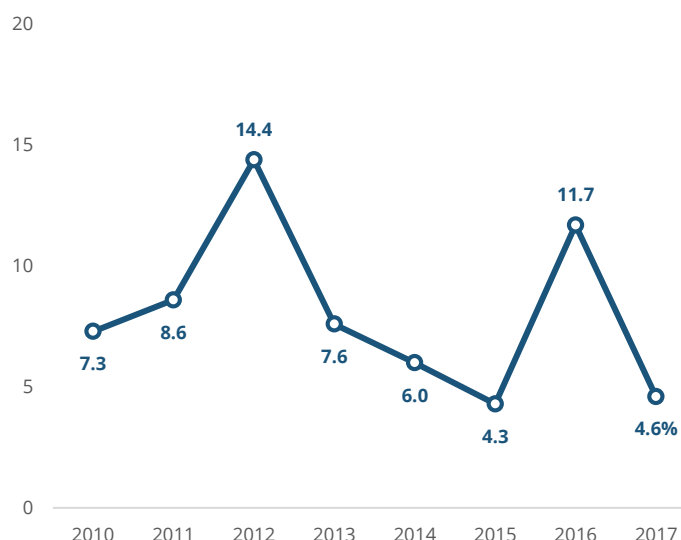
Executive Summary

2017 Synar Inspection Study

“Activities to increase restrictions on tobacco product sales and availability” are key to reducing the “availability of tobacco products” and “susceptibility to experimentation with tobacco products.” Over time, these activities reduce initiation of tobacco use, the prevalence of tobacco use among young people, and the morbidity and mortality that result from tobacco use (Centers for Disease Control and Prevention [CDC], 2014, p. 21). The Synar amendment and related monitoring of compliance with state laws against selling tobacco products to minors are key parts of tobacco prevention efforts nationally and in Wyoming.

Figure ES-1: The 2017 (FFY 2018) Synar Retailer Violation Rate Was Relatively Low

Synar RVRs since implementing smokeless tobacco inspections

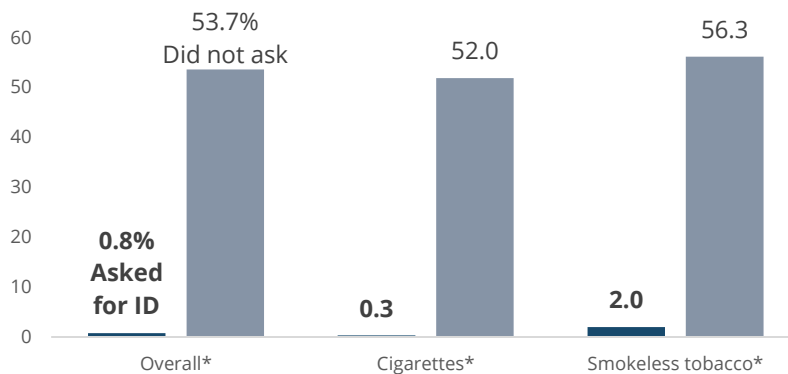


The 2017 (FFY 2018) weighted Synar tobacco retailer violation rate (RVR) was 4.6%, below the federally stipulated maximum of 20.0%. This is also a return to a low RVR after the high RVR in 2016 (FFY 2017; Figure ES-1). WYSAC met the Substance Abuse and Mental Health Administration’s (SAMHSA’s) sample size requirements and their precision requirement of a 3% or smaller margin of error (SAMHSA, 2016). WYSAC satisfied SAMHSA requirements of having a balance of inspections completed by youth of each gender and youth of each age (16 or 17).

As it has been since 2007 (WYSAC 2017a), clerks not asking for identification was the strongest predictor of violations. Overall, the odds of a clerk violating when not asking for identification were 153.0 times higher than when asking for identification. Only two clerks (one cigarette

Figure ES-2: Asking for Identification Prevents Violations

Violation rates by clerks asking for identification or not and by tobacco type



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2017 ENDS Pilot Study

The Wyoming legislature and governor added electronic nicotine delivery systems (ENDS) to Wyoming's legal definition of tobacco products in the state's youth access law in 2013 (State of Wyoming, 2013; 2017). In 2015, Wyoming high school students reported greater prevalence of using ENDS than U.S. high school students (Youth Risk Behavior Surveillance System [YRBSS], 2015), and ENDS use has been linked to greater risk for using combustible tobacco products (Leventhal et al., 2015). Because of this law and these dual concerns, the Wyoming Department of Health, Public Health Division (PHD), requested a pilot study to prepare for ENDS to be included in future Synar work and/or other work related to preventing youth access to ENDS.

In 2017, the second year of the ENDS Pilot Study, WYSAC drew a random sample of one-third of the Synar sample to be inspected for ENDS products in addition to the Synar inspections. The ENDS Pilot Study protocol had youth inspectors ask for the two products that are the national market leaders for mass-produced ENDS. Vape shops—retailers that focus on selling ENDS, sometimes to the exclusion of selling traditional tobacco products—were not included in the ENDS Pilot Study. In 2017, inspection teams attempted 114 inspections across the state and completed 63 of them (55.3%, compared to completing 85.5% of all attempted Synar inspections). Although this rate is better than the 2016 raw completion rate for the ENDS Pilot Study (46.1%),

inspection and one smokeless tobacco inspection)¹ asked for identification and then committed a violation by being willing to sell the tobacco product (Figure ES-2).

¹ Unweighted frequencies.

it still indicates that incorporating ENDS into official Synar inspections would make it more difficult to meet SAMHSA's minimum completion rate requirements for Synar.

During the Synar inspections for cigarettes and smokeless tobacco, youth were trained to look for whether cigarettes, smokeless tobacco, and/or ENDS were accessible to customers without asking the clerk. This protocol also serves as a visual inspection for the presence of ENDS in Synar-eligible retailers. Youth noted the location of ENDS in 32.5% of the completed Synar inspections. The results of those often quick visual inspections could underestimate the availability of ENDS in Synar eligible retailers. Still, the fact that it is a low percentage provides additional evidence that these products are often unavailable in Wyoming's Synar-eligible retailers. Continuing improvements to the Synar retailer list, specifically identifying which stores sell which products, could improve the chances of completing an inspection.

The unweighted violation rate for the ENDS inspections was 4.8% (three violations out of 63 completed inspections). This compares to a violation rate of 11.8% in 2016. In both years, the unweighted violation rates for the Synar Inspection Study (12.0% in 2016 and 5.2% in 2017) and the ENDS Pilot Study were roughly similar.

In 2017, the vast majority (93.4%) of clerks asked the youth inspectors for their identification during the completed ENDS inspections. This indicates that clerks are aware that these products should not be sold to minors. The small number of completed inspections combined with the imbalance in results (90.2% of clerks asked inspectors for identification and then terminated the sale when the inspector did not provide identification) prevented WYSAC from determining whether there is a statistical relationship between asking for identification and violations for ENDS.

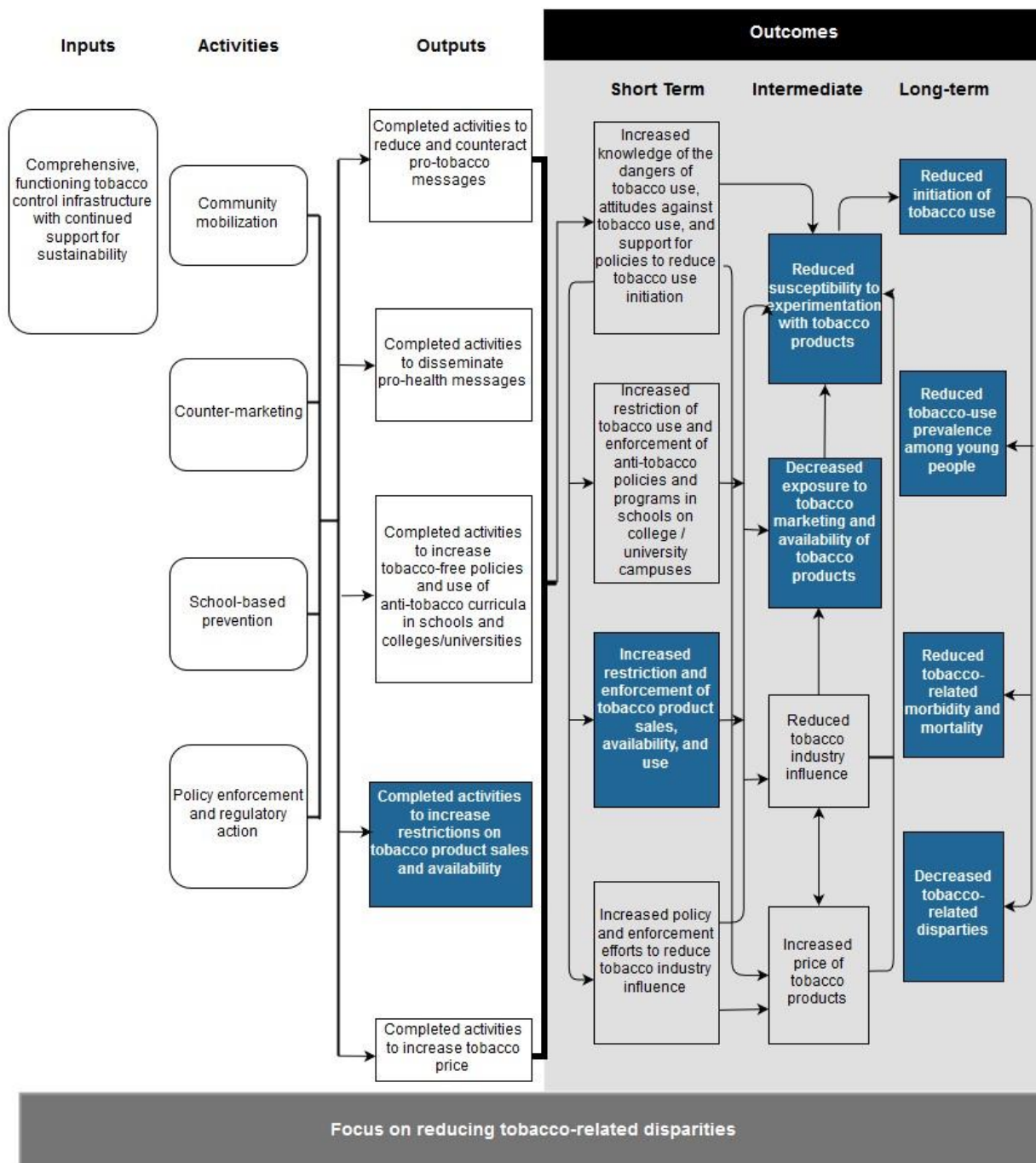
Background and Evaluation Context

In 1992, the United States Congress enacted the Alcohol, Drug Abuse, and Mental Health Administration Reorganization Act, which includes an amendment (section 1926) aimed at decreasing youth access to tobacco. This amendment, signed by President George H. W. Bush and named for its sponsor, former Representative Mike Synar (Democrat, Oklahoma), requires states to adopt and enforce state laws prohibiting the sale of tobacco to youth under the age of 18. To be in compliance, states must also conduct annual, random, and unannounced inspections to ensure compliance with the state law and develop a strategy for achieving a retailer violation rate (RVR) of less than 20.0% (Substance Abuse and Mental Health Services Administration [SAMHSA], 2010). Since 2003, the Wyoming Department of Health, Public Health Division (PHD), has contracted with the Wyoming Survey & Analysis Center (WYSAC) at the University of Wyoming to conduct Wyoming's annual Synar Inspection Study to assess tobacco retailers' compliance with the state's Synar-compliant law (Statute 14-3-3; State of Wyoming, 2017).

WYSAC's Synar evaluation complements the evaluation of Wyoming's Tobacco Prevention and Control Program, which follows the Centers for Disease Control and Prevention (CDC) model. Specifically, the CDC, Office of Smoking and Health (2014, p. 21) states, "activities to increase restrictions on tobacco product sales and availability" are key to reducing "availability of tobacco products" and "susceptibility to experimentation with tobacco products." As highlighted in Figure 1, such activities reduce the initiation of tobacco use, the prevalence of tobacco use among young people, and the morbidity and mortality that result from tobacco use. The Synar amendment and related monitoring of compliance with state laws against selling tobacco products to minors are key parts of tobacco prevention efforts nationally and in Wyoming.

Figure 1: Synar Is Part of Evaluating a Comprehensive Tobacco Prevention and Control Program.

CDC Logic Model for Goal Area 1, Preventing Initiation of Tobacco Use



Note: Highlighting added by WYSAC.

Source: CDC, 2014, p. 21.

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Electronic nicotine delivery systems (ENDS; also known as electronic cigarettes, e-cigarettes, ecigs, vape-pens, and other names) are a developing public health concern in Wyoming and the nation as a new tobacco product. ENDS are battery powered devices that produce an aerosol by heating a liquid instead of producing smoke from burning tobacco. Contents of the liquid vary across products, and some models allow for customized liquids. Youth use of ENDS is concerning because some research shows youth who have used ENDS are more likely to transition to use of combustible tobacco (Leventhal et al., 2015). Senate File 103 was a bill introduced to the Wyoming Legislature January 10, 2013, (and signed into law later that year) to add “electronic cigarettes” to the definition of “tobacco products” in legislation designed, in part, to prevent the sale of tobacco products to minors (Wyoming Statute 14-3-3). The bill defines electronic cigarettes as “a product that employs any mechanical heating element, battery or electronic circuit, regardless of shape or size, that can be used to deliver doses of nicotine vapor by means of heating a liquid nicotine solution contained in a cartridge or other delivery system” (State of Wyoming, 2013, p. 2; 2017).

A greater percentage of Wyoming high school students (30%) report being current ENDS users when compared to the national estimate (24%). Additionally, about twice as many Wyoming high school students report current ENDS use as compared to current cigarette use (16%; Youth Risk Behavior Surveillance System [YRBSS], 2015).

The YRBSS only asked about ENDS use in 2015, making a trend analysis with that data impossible. Data from a different survey show a decrease in middle and high school students’ use of combustible tobacco products like cigarettes that coincided with a rapid increase in ENDS use. Nationally, ENDS use by high school students on the National Youth Tobacco Survey (NYTS) increased from 1.5% in 2011 to 16.0% in 2015, becoming the most commonly used tobacco product in this age group. In comparison, high-school cigarette use declined from 15.8% to 9.3% over the same time on that survey (Singh, et al., 2016).

Because of the state law (Statute 14-3-3) and public health concerns about the growing popularity of ENDS use described above, the PHD asked WYSAC to conduct a pilot study of retailer compliance with state law prohibiting the sale of ENDS to minors with a sampling frame and protocol similar to the Synar Inspection Study. The results of the 2016 and 2017 ENDS Pilot Studies can be used to establish a realistic protocol for ENDS buy attempts and identify obstacles to incorporating ENDS buy attempts into prevention work, including future Synar inspections.

Methods

This section includes descriptions of the sampling design, inspection teams, protocols, inspected stores, and analysis for the 2017 (FFY 2018) Synar Inspection Study and 2017 ENDS Pilot Study.

Sampling Design²

SYNAR INSPECTION STUDY

At the end of the 2016 (FFY 2017) Synar Inspection Study, WYSAC removed ineligible and closed stores from the tobacco retailer list. In the spring of 2017, WYSAC requested updates to this revised list from the county-based community prevention specialists (CPSs) working for the Prevention Management Organization of Wyoming (PMO) and sheriffs and chiefs of police across the state, in collaboration with the Wyoming Association of Sheriffs and Chiefs of Police (WASCOP). As in 2016, WYSAC incorporated publicly available results of the U. S. Food and Drug Administration (FDA; 2017) tobacco compliance inspections. The results of a Freedom of Information Act (FOIA) request for the FDA contractor's actual retailer list indicated that it does not have additional information that would indicate eligibility for Synar or types of products sold at the retailers. Before adding stores from the FDA inspections to the Synar list, WYSAC eliminated liquor stores inspected by the FDA because those stores are not eligible for Synar. (Under Wyoming law, they are legally inaccessible to unaccompanied minors.) WYSAC used this updated list of 628 stores for the 2017 (FFY 2018) tobacco retailer list frame for the Synar Inspection Study.

As in previous years, WYSAC categorized each tobacco retailer into one of two strata based on its location in either an urban town or a rural town. WYSAC defined urban towns as having a population of 3,000 or more and rural towns as having a population less than 3,000. The list frame had 436 stores in the urban stratum and 192 stores in the rural stratum. WYSAC used the Synar Survey Estimation System (SSES), Version 6.0, to determine the sample size for each stratum. (See Appendix C.1 for more information about the sampling calculations and procedure.) WYSAC used a 20% safety margin for noncompletion, as recommended by SAMHSA (2011). SSES yielded a planned sample size of 177 for the urban stratum and a

² Stores on federal land, such as national parks and Indian reservations are not inspected during the Synar Inspection Study. Stores in the towns of Moose and Moran Junction are considered to be in Grand Teton National Park. Stores in the towns of Burris, Crowheart, Ethete, Ft. Washakie, Hudson, St. Stephens, Arapahoe, Johnstown, and Boulder Flats are considered part of the Wind River Indian Reservation. Additionally, stores within state parks are not part of the Synar study because they are considered inaccessible to youth.

planned sample size of 161 for the rural stratum, resulting in a total planned sample of 338 stores. WYSAC drew a random sample for each stratum using IBM SPSS Statistics Version 23.

ENDS PILOT STUDY

Because the goal of the ENDS Pilot Study was to test the protocol, WYSAC did not conduct any formal assessment to determine a sample size. Instead, the goal was to provide a system that would ensure a rough balance of boy and girl inspectors conducting the ENDS inspections without interfering in the Synar inspections. WYSAC drew a random sample of one-third of the Synar sample to be inspected for ENDS. Drivers were instructed to conduct the Synar inspections at these retailers first, followed by the ENDS inspection.

Inspection Teams

The same inspection teams completed inspections for the 2017 (FFY 2018) Synar Inspection Study and 2017 ENDS Pilot Study. The nine teams typically consisted of one adult supervisor/driver and two youth inspectors (one boy and one girl). As required by the Wyoming Attorney General, a local law enforcement officer (from county sheriffs' offices and municipal police departments) was available for every inspection. Law enforcement officers did not accompany the youth inspectors into the stores or issue any citations for noncompliance. The role of the law enforcement officers was to ensure the safety of the inspection teams. WYSAC collaborated with the Wyoming Association of Sheriffs and Chiefs of Police (WASCO) to identify and coordinate with local officials who had jurisdiction over the areas in which the teams conducted inspections.

For three trips, WYSAC was unable to recruit gender mismatched pairs. One trip was completed by a pair of girls, one trip was completed by a total of three girls (in two pairings), and one trip was completed by a pair of boys. WYSAC planned the number of stores in these trips to maintain a balance of inspections conducted by boys and girls across the state, as required by SAMHSA (2010). One of the trips that had a gender balanced team employed two different boys on different days.

WYSAC recruited three adults in the Laramie, Wyoming, area to be the adult supervisors. Prior to hiring the adult supervisors, the University of Wyoming conducted criminal background checks and reviewed the driving records of applicants. WYSAC trained all adult supervisors in the Synar Inspection Study and ENDS Pilot Study protocols. The adult supervisors were then responsible for training the youth inspectors.

As in previous years, WYSAC recruited youth inspectors primarily by asking previous inspectors to participate again (if they were still in the eligible age range) and/or to provide

referrals. Additionally, WYSAC partnered with other organizations to identify youth contacts across the state. WYSAC contacted Wyoming 4-H, school officials across the state, and some of the CPSs to recruit potential youth inspectors. WYSAC contacted potential youth inspectors via telephone to describe the project and get verbal consent from one of their parents or guardians. Once the youth and the parent/guardian expressed interest, WYSAC sent them a written description of the project, a parent/guardian permission form, and hiring forms. WYSAC required completed parent permission forms before any youth could participate in the inspections.

Protocols

The FFY 2018 Synar inspections began on July 5, 2017, and ended on August 15, 2017. Much of the Synar Inspection Study and the ENDS Pilot Study protocols were identical. These shared elements follow, with subsequent sections providing additional details for each protocol.

All youth inspectors resided within the area they inspected, eliminating the need for overnight stays by the youth inspectors. To maximize consistency across inspections, all youth inspectors followed a written script (see Appendix A) and role-played with the adult supervisors until they mastered the buying procedure. Adult supervisors also trained youth inspectors to observe and describe certain aspects of the stores and clerks (e.g., the location of tobacco products, including ENDS, and the approximate age of the clerks). Upon arriving at a store, one youth inspector (alternating between boys and girls) entered the store and, following the buyer script, attempted to purchase tobacco (cigarettes or smokeless tobacco inspections first, followed by the second youth attempting the ENDS inspection when applicable).

When youth inspectors knew anyone in the store (including any employee or customer), they left the store without attempting a purchase. If the second youth inspector did not know anyone in the store, he or she would then enter the store and attempt the buy. If both youth inspectors knew someone in the store (e.g., the first youth identified a mutual acquaintance), the team returned later to reattempt the buy, schedule permitting.

Survey protocol required youth inspectors to leave their identification at home or in the car with the adult supervisors. This strategy allowed youth inspectors to answer honestly if a clerk asked for identification, saying, "I don't have it on me." Not providing identification during inspections safeguards youth privacy by not revealing their names or where they live. Youth inspectors were trained to answer honestly if asked their age.

The youth inspectors each carried \$1 in cash into each store, so they could not produce enough money to complete the purchase if a clerk was willing to sell the tobacco product. In accordance

with protocol, no purchase attempts were consummated. The inspection was completed either by a clerk's refusal to sell or by a violation indicated by the youth inspector ending the transaction (e.g., when the clerk stated the price of the product and waited for payment).

Immediately following each inspection, youth inspectors returned to the vehicle and verbally reported the details of the inspection to the adult supervisors, who then entered this information on a data form (see Appendix D). WYSAC collected the forms at the end of each inspection trip. The information reported on the form includes the following:

- Inspection date and time of day (morning or afternoon);
- Youth inspector name, age, and gender;
- Adult supervisor name;
- Store name and address (with corrections for the list frame as needed);
- Completion status of the inspection (ineligible store, eligible store that was not inspected, completed inspection);
- Store type;
- Location of tobacco products in the store (accessible or not for cigarettes, smokeless tobacco, and ENDS regardless of the tobacco type requested during the inspection);
- The presence of any visible youth access messages (e.g., "No Sales to Minors");
- Clerk gender and estimated age;
- Type and brand of tobacco product requested;
- Outcome of the buy attempt (violation, nonviolation, noncompletion);
- Clerks' stated price for the tobacco products (primarily for inspections that ended in a violation, though some youth noted the price they saw on the shelf); and
- Whether the clerk asked the youth inspector for identification or their age.

SYNAR INSPECTION STUDY PROTOCOL

During most cigarette inspections, youth inspectors attempted to purchase Marlboro Gold cigarettes. When those were unavailable, girls attempted to purchase Camel Blues, and boys attempted to purchase Camels. One out of every three inspections was for smokeless tobacco. During smokeless tobacco inspections, the youth inspectors (regardless of gender) asked for Skoal Wintergreen long cut or Copenhagen Wintergreen long cut (when Skoal Wintergreen was unavailable). After each inspection, drivers completed the data form described above based on the youth report.

Adult supervisors photographed each youth inspector during the inspections. When the inspections were complete, WYSAC asked 184 raters unfamiliar with the Synar project to estimate the age of each youth inspector. WYSAC then calculated the mean for the usable ratings for each youth to determine the age rating for each inspector. Raters had the option of

saying they knew a youth inspector instead of rating their age; such responses were not included in calculating the means. Two raters guess the exact same age for every youth. One of these raters guessed a relatively high age; the other guessed a relatively low age. Because of this suspicious and unique lack of variability, WYSAC did not include them in calculating the means. These ratings allowed WYSAC to statistically test for whether the youth inspectors who looked 18 or older made more successful purchase attempts (i.e., more violations). The average age rating of all youth inspectors was 18.5. The lowest age rating was 15.8, and the highest age rating was 20.0. Of the 20 youth inspectors, 8 had age ratings of 18 or older, and 12 had age ratings younger than 18. Because every youth inspector was, and looked, younger than 26, FDA regulations (FDA, 2010b) dictate that every youth inspector should have been asked for identification on every inspection.

RECENT CHANGES TO SYNAR PROTOCOL

In 2010, the first year to include smokeless tobacco inspections, youth inspectors were not instructed to ask for a specific flavor or cut of tobacco. WYSAC added flavors and cut to the 2011 protocol to improve the realism of purchase attempts. WYSAC used data on popular brands, flavors, and cuts of tobacco (University of Medicine and Dentistry of New Jersey [UMNDJ]-School of Public Health, 2006) to choose the brands, flavor, and cut for the script. Also in 2011, WYSAC altered the script for cigarette inspections, which had previously had youth inspectors ask for Marlboro Lights or Camel Lights, to the replacement brands (Marlboro Golds and Camel Blues) introduced to the marketplace in response to the 2009 Family Smoking Prevention and Control Act prohibiting the use of the term light in branding cigarettes (FDA 2010a).

In 2012, WYSAC increased the frequency of the inspections for smokeless tobacco from one out of every five inspections (as it was in 2010 and 2011) to one out of every three inspections to allow for analyses of factors associated with violations during smokeless tobacco inspections. Because of these changes to protocol, WYSAC only makes general comparisons of results from before smokeless tobacco was added to the protocol and results from after smokeless tobacco was added to the protocol. Until 2012, WYSAC employed 15-year-olds as youth inspectors in addition to 16- and 17-year-old youth inspectors.

In 2016, WYSAC updated the inspection form based on SAMHSA feedback, to ease data processing, and to accommodate the ENDS Pilot Study conducted with the Synar Inspection Study.

In 2017, WYSAC made minor revisions to the inspection form to correct errors in spelling and ease data processing. WYSAC changed the sample size calculation method to account for volatility in the RVR indicated by high violation rates in 2016 and 2012. Instead of using the

previous year's results (violation rate, accuracy rate, and completion rate), WYSAC used three-year averages. This shift allows for more stable sample sizes and eases planning by reducing the effects of a single year with abnormal results.

ENDS PILOT STUDY PROTOCOL

In 2017, ENDS inspection sites were listed as such on the teams' lists of stores to inspect in addition to being listed as Synar inspections. VUSE and blu are the national market leaders for mass-produced ENDS sold in convenience stores (Vonder Haar, 2015). VUSE sells kits (a battery, charger, and replaceable liquid cartridge that also serves as the mouthpiece) and refills for their kits, but not disposable products. Blu offers disposable devices and refillable devices. In 2016, the first author of this report visited several Synar-eligible retailers in Laramie and, based on visual inspection, determined that both brands were consistently available in Laramie's Synar-eligible retailers, including chain gas stations and truck stops that might have similar inventories across the state. There was not a clear third-option for a brand of ENDS to include in the protocol. Conversations over SAMHSA's Synar email list also suggested that these brands should be popular and failed to identify a clear third option. WYSAC developed a protocol for each brand.

For the VUSE protocol, youth asked for a berry-flavored refill. If this product was unavailable, youth would ask for a cherry-flavored blu disposable device. WYSAC thought asking for the relatively cheap, popular, disposable device would be a realistic alternative compared to purchasing a new, more expensive starter kit for VUSE or another brand. VUSE kits only came in tobacco and menthol flavors.

For blu inspections, youth asked for a cherry-flavored disposable device. In both protocols, youth were trained to accept alternative flavors (e.g., menthol) if offered by the clerk when berry or cherry were not available. WYSAC added this flexibility to the 2017 ENDS inspection Study in an attempt to improve the completion rate.

In 2016, youth conducting Synar and ENDS inspections were allowed to enter stores at the same time if the driver felt that would not arouse suspicion. However, that may have created confusion when the first youth was unable to complete the Synar inspection. In 2017, drivers were instructed to complete the Synar inspection before sending the second youth into the store to attempt an ENDS inspection. Drivers then completed the data form described above.

Inspected Stores

SYNAR INSPECTION STUDY STORES

Of the 338 stores in the Synar Inspection Study sample, 36 were ineligible. These stores were ineligible for the following reasons: out of business (4), did not sell tobacco products (22), inaccessible by youth (6), could not be located (2), and duplicate (2). Thus, the total number of eligible stores was 302, 89.3% of the sample. Another 13 stores were coded as eligible but not inspected. These stores were coded as not inspected for the following reasons: in operation but closed at time of visit (2), both youth inspectors knew a person in the store (1), tobacco out of stock (2), and other (8): no support from law enforcement, (6), salesperson did not speak English (1), and driver error³ (1). WYSAC inspected and used data for 289 stores, 95.7% of the eligible stores in the sample. Of these, 150 inspected stores were in the urban stratum (98.0% completion rate), and 139 inspected stores were in the rural stratum (93.3% completion rate), meeting or exceeding the effective sample sizes and completion rates for each strata and overall.

ENDS PILOT STUDY STORES

Inspection teams attempted 114 ENDS inspections (44 rural outlets and 70 urban outlets). Teams were able to complete 63 (55.3% of the sample) inspections. Nearly one fourth (24.6%) of the sampled outlets were eligible for the Synar inspections but ineligible for the ENDS Pilot Study because they did not sell ENDS products. In total, 19 stores sampled for ENDS inspections were ineligible for either the ENDS or Synar inspections: Ten (8.8%) of the sampled stores were ineligible for both inspection types because they did not sell any tobacco products. Three (2.6%) stores were ineligible because they were out of business, four (3.5%) stores were inaccessible to youth, one (0.9%) couldn't be located, and one (0.9%) was a duplicate. Thus, a total of 67 stores (58.8% of the sample) were eligible for ENDS inspections. Two (1.8% of the sample) of these stores were coded as eligible, incomplete because both youth knew the salesperson and two (1.8%) were uninspected because of a lack of law enforcement support. WYSAC inspected and used data for 63 ENDS inspections, 94.0% of the eligible stores in the sample.

Inspection teams were able to complete 18 rural inspections, 40.9% of the rural sample, and 45 urban inspections, 64.3% of the urban sample. This difference in completion rate was statistically significant, suggesting that the products included in the ENDS protocol are more readily available in urban outlets.

³ The youth conducted an ENDS inspection instead of a Synar inspection. The driver did not account for this error. When this error was discovered, none of the youth or drivers were available for a trip that would have been needed to complete the inspection.

Analysis

To calculate most of the descriptive statistics reported in the section Inspected Stores (above) and the weighted RVR for the Synar Inspection Study, WYSAC used SSES Version 6.0, an add-in for Microsoft Excel. SAMHSA distributes and recommends use of this software to facilitate reporting of analyses by each state.

WYSAC conducted additional analyses in IBM SPSS Statistics version 24.⁴ For the Synar Inspection Study, WYSAC conducted crosstab analyses to identify variables associated with violations. Depending on the specific analysis, WYSAC used Pearson's chi-squared test or one-tailed Fisher's exact test to identify statistically significant associations. Fisher's exact test is an alternative to Pearson's chi-squared test that provides more reliable results than Pearson's chi-squared in analyses when a crosstab only has a few observations in some of the conditions (e.g., no violations for cigarette inspections where cigarettes were accessible). As a general rule, Fisher's exact tests are preferred when more than 25% of conditions have fewer than five expected observations or when any condition has zero observations. In Appendix C.3, WYSAC reports which test was used for each tested association, along with detailed statistical results. In this report, WYSAC reports significant relationships when $p < .05$, suggesting that one can say with 95% confidence that the differences are not due to chance. In general, WYSAC accounts for the stratified sample by reporting weighted data (consistent with SSES). However, WYSAC occasionally reports unweighted counts for clarity (such as in the section Inspected Stores, Appendix B, and as noted in the text).

For the ENDS Inspection Study, WYSAC approached the analyses differently because the purpose of the study is to develop an inspection protocol and identify barriers to incorporating ENDS into future Synar Inspection Studies and/or other prevention work. Additionally, because the number of ENDS retailers in each stratum of the population is unknown and was not used in sampling, WYSAC did not weight the data. Instead, WYSAC only reports unweighted descriptive statistics and strata-specific descriptive statistics obtained from SPSS.

⁴ Version 24 became available after drawing the sample with version 23.

Key Findings

Synar Inspection Study

This section details key findings from the 2017 (FFY 2018) Synar Inspection Study. Detailed statistical results (test statistics, degrees of freedom, weighted sample size, and p values) are in Appendix C.3.

WYSAC recruited 20 youth inspectors. The balance of inspections completed by each gender and by each age met SAMHSA (2010) requirements. Eleven girls completed 51.2% of the inspections; nine boys completed 48.8% of the inspections. Ten 16-year-olds completed 50.2% of the inspections, and ten 17-year-olds completed 49.8% of the inspections. However, a disproportionate amount of the inspections conducted by girls were conducted by 17-year-olds, and a disproportionate amount of inspections conducted by boys were conducted by 16-year-olds. See Table 1 for the detailed breakdown by age and gender.

Table 2 provides the critical output from SSES.

Table 1: Uneven Proportions of Inspections by Age within Gender

Percentage of Synar inspections by gender and age

	Girls	Boys
16 years old	17.3%	32.9%
17 years old	33.9%	15.9%

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Table 2: The FFY 2017 RVR Met the SAMHSA Requirement

Output from the Synar Survey Estimation System (SSES)

CSAP-SYNAR REPORT

State	WY
Federal Fiscal Year (FFY)	2018
Date	9/28/2017 8:53
Data	SSESv6_DataEntry SYNAR only JP.xlsx
Analysis Option	Stratified SRS with FPC

Estimates

Unweighted Retailer Violation Rate	5.2%
Weighted Retailer Violation Rate	4.6%
Standard Error	0.8%
Is SAMHSA Precision Requirement met?	YES
Right-sided 95% Confidence Interval	[0.0%, 6.0%]
Two-sided 95% Confidence Interval	[2.9%, 6.2%]
Design Effect	0.9
Accuracy Rate (unweighted)	89.3%
Accuracy Rate (weighted)	88.3%
Completion Rate (unweighted)	95.7%

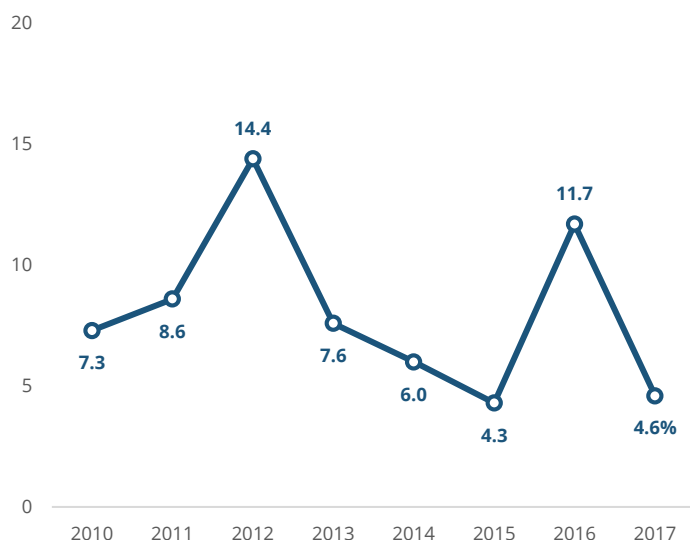
Sample Size for Current Year

Effective Sample Size	237
Target (Minimum) Sample Size	237
Original Sample Size	338
Eligible Sample Size	302
Final Sample Size	289
Overall Sampling Rate	51.8%

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Figure 2: The 2017 (FFY 2018) Synar Retailer Violation Rate Was Relatively Low

Synar RVRs since implementing smokeless tobacco inspections



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The FFY 2018 (calendar year 2017) Synar RVR was 4.6%, with a standard error of 0.8%. This violation rate is below the 20.0% threshold, including accounting for the one-sided confidence interval. This rate is also a return to a low RVR after the high RVR in 2016 (FFY 2017; Figure 2). WYSAC met SAMHSA's precision requirement of a 3% or smaller margin of error for the one-sided 95% confidence interval (SAMHSA, 2016). This margin of error was 1.3%.

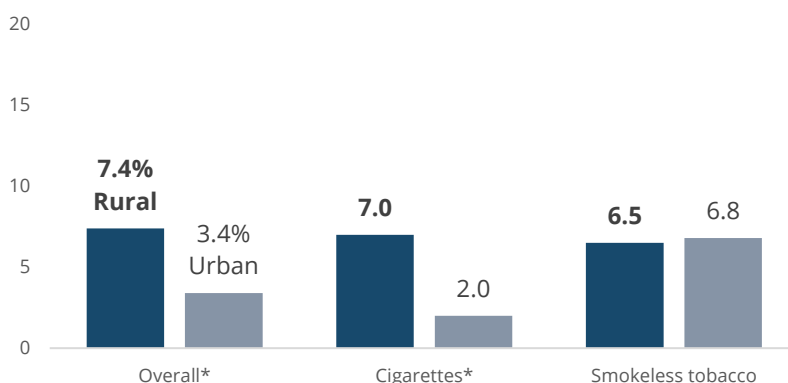
The RVR for cigarettes was 3.4%, statistically significantly lower than the RVR of 7.2% for smokeless tobacco. Throughout this report, WYSAC reports violation rates broken down by tobacco type because of this difference and PHD interest.

Overall, and for cigarette inspections, violations were more likely to occur in rural outlets. For smokeless tobacco inspections, however, the difference between strata was not statistically significant (Figure 3).

The adult supervisor, time of inspection, accessibility of tobacco, youth inspector gender (girl or boy), clerk

Figure 3: RVRs Varied by Strata Overall and for Cigarette Inspections

Violation rates by strata and tobacco type



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gender, and presence or absence of youth access signs were not significantly associated with retailer violations. WYSAC does not provide further details for these results in the body of the report.

SIGNIFICANT ASSOCIATIONS WITH VIOLATION

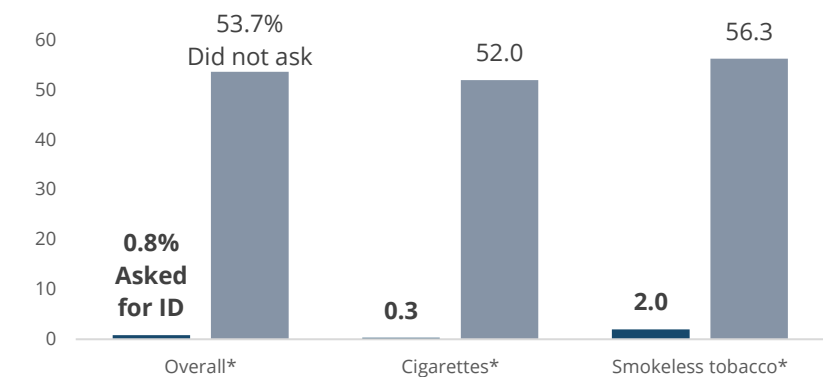
Generally Significant Predictors of Violation across Tobacco Types

Two factors were associated with violations when considering all inspections, for cigarette inspections, and for smokeless tobacco inspections: clerks not asking for identification and clerks' estimated ages of 35 or younger.

As it has been since 2007 (WYSAC 2017a), clerks not asking for identification was the strongest predictor of violations. Figure 4 shows details for weighted violation rates (overall, for cigarette inspections, and for smokeless tobacco inspections) by whether the clerk asked for identification. Overall, the odds of a clerk violating when not asking for identification were 153.0 times higher than when asking for identification. Only two clerks (one cigarette inspection and one smokeless tobacco inspection)⁵ asked for identification and then committed a violation by being willing to sell the tobacco product.

Figure 4: Asking for Identification Prevents Violations

Violation rates by clerks asking for identification or not and by tobacco type

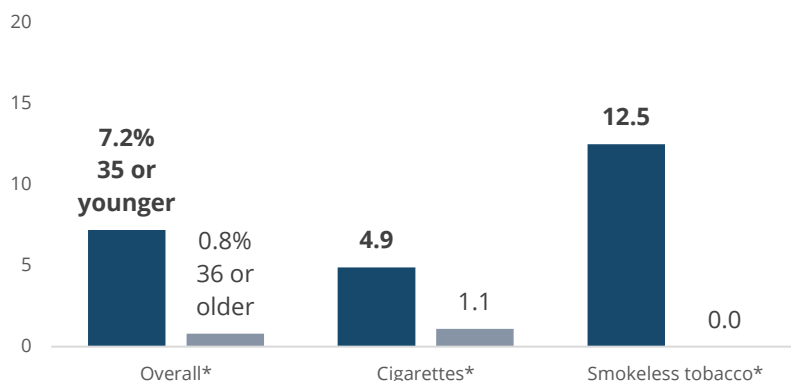


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⁵ Unweighted frequencies.

Figure 5: Younger Clerks Were More Likely to Violate

Violation rates by clerks' ages as estimated by youth inspectors



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The clerks' ages, as estimated by the youth inspectors, were also key predictors of violations. Clerks who the youth inspectors thought looked 35 or younger (the median split) were more likely to commit a violation than clerks the youth thought looked 36 or older. Figure 5 shows details for weighted violation rates (overall, for cigarette inspections, and for smokeless tobacco inspections) by clerk age, as estimated by the youth inspectors.

Significant Predictors for a Single Inspection Category

This section includes circumstances where results for cigarette inspections differed from results for smokeless tobacco or the entire Synar sample. Five variables were associated with violations for cigarette inspections, but not for smokeless tobacco inspections: stratum (detailed on page 20), month of inspection, store type, clerks asking the youth inspector for their age, and the youth inspectors' age. One variable was associated with violations for smokeless tobacco inspections, but not for cigarette inspections: youth inspector's estimated age.

Overall and for cigarettes, violations were more likely in July than in August (Table 3).

Table 3: RVR Overall and for Cigarette Inspections High in July

RVR by month of inspection

	Overall*	Cigarettes*	Smokeless tobacco
July	6.8%	5.7%	9.3%
August	1.2%	0.5%	3.0%

*Statistically significant difference.

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Overall and for cigarettes, violations were more common in convenience stores, with or without gasoline, than other store types (Table 4).

For cigarettes, clerks who asked the youth inspectors their age were more likely to commit a violation, despite the youth inspectors being trained to answer honestly (Table 5). This result is counter-intuitive because all youth inspectors were younger than 18. One⁶ clerk (for a cigarette inspection) committed a violation after asking the youth inspector's age.

Table 4: RVR Overall and for Cigarettes Was High for Convenience Stores

RVR by dichotomized store type

	Overall*	Cigarettes*	Smokeless tobacco
Convenience stores	5.9%	5.0%	7.7%
All other stores	2.0%	0.7%	6.3%

*Statistically significant difference.

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Table 5: RVR for Cigarettes Was High When Clerks Asked the Inspector's Age

RVR by clerk asking the youth inspector's age

	Overall	Cigarettes*	Smokeless tobacco
Asked age	10.7%	14.3%	0.0%
Did not ask age	3.8%	2.9%	5.8%

*Statistically significant difference.

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⁶ Unweighted frequency.

Youth inspectors who were 17, rather than 16, were more likely to experience a violation when attempting to purchase cigarettes. This result is intuitive. However, overall and for smokeless tobacco inspections, the actual age was not associated with violations while the inspectors' estimated ages were. Counter-intuitively, youth inspectors who looked younger than 18 were more likely to experience violations than older looking inspectors (Table 6). The age estimates based on photographs do not account for other factors that clerks may use when estimating a customer's age, such as tone of voice, confidence, or height. Additionally, the age estimates based on the youth photographs tend to overestimate the youth's actual age. These additional variables and general inaccuracy of the age estimates may explain the counter-intuitive result.

Table 6: Youth Inspector Age and Age Ratings Had a Complicated Relationship with RVR

RVR by youth inspector age

	Overall	Cigarettes*	Smokeless tobacco
16	3.1%	1.0%	8.0%
17	5.6%	5.4%	6.4%

RVR by youth inspector age rating

	Overall*	Cigarettes	Smokeless tobacco*
Looked younger than 18	7.3%	3.6%	16.2%
Looked 18 or older	2.7%	3.3%	1.0%

*Statistically significant difference.

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ENDS Pilot Study Results

Overall, inspection teams were able to complete 63 out of 114 attempted inspections, 55.3% of the attempts. Twenty three (36.5%) of these inspections were for disposable ENDS products. This compares to 47% in 2016 (WYSAC, 2017a). Forty (63.5%) were for ENDS refill cartridges. This compares to 52.9% in 2016 (WYSAC, 2017a). Because the 2017 sample was evenly split between planned disposable and refill inspections, the difference in 2017 may indicate that disposable ENDS have relatively low market share in Wyoming's Synar-eligible retailers.

Eleven girls (four 16-year-olds and seven 17-year-olds) and nine boys (six 16-year-olds and three 17-year-olds) completed the ENDS inspections. This is the same as for the Synar Inspection Study.

Overall, teams attempted a total of 114 ENDS inspections and found 67 eligible outlets, a 58.8% eligibility rate (SAMHSA calls this an accuracy rate). For comparison, the unweighted eligibility rate for the Synar inspections was 89.3%. Teams completed 63 inspections in 67 Synar-eligible retailers, a 94.0% completion rate. The unweighted Synar completion rate was 95.7%.

In rural areas, teams attempted a total of 44 inspections and found 20 ENDS-eligible outlets, a 45.5% eligibility rate. They completed inspections in 18 out of 20 ENDS-eligible retailers, a 90.0% completion rate. These compare to a rural 92.5% eligibility rate and 93.3% completion rate for Synar.

In urban areas, teams attempted a total of 70 inspections and found 47 ENDS-eligible outlets, a 67.1% eligibility rate. They completed 45 inspections in 47 ENDS-eligible retailers, a 95.8% completion rate. These rates compare to an urban 86.4% accuracy rate and 98.0% completion rate for Synar. The overall rural completion (40.9%) rate was worse than the urban overall completion rate (64.3%).

During the Synar inspections for cigarettes and smokeless tobacco, youth were trained to look for whether cigarettes, smokeless tobacco, and/or ENDS were accessible to customers without asking the clerk. This protocol also serves as a visual inspection for the presence of ENDS in Synar-eligible retailers. Youth noted the location of ENDS in 94 of the 289 completed Synar inspections (32.5%). Because the transaction for a Synar inspection may not allow minors sufficient time for a thorough visual inspection of the retail outlet, especially for relatively novel ENDS, the results of those visual inspections could underestimate the availability of ENDS in Synar eligible retailers. Still, the fact that it is a low percentage provides additional evidence that these products are often unavailable in Wyoming's Synar-eligible retailers.

The unweighted violation rate of 4.8% for the 63 completed ENDS inspections was roughly comparable to the 5.2% unweighted violation rate for the Synar inspections. Within the urban stratum, three of the 45 (6.7%) completed inspections resulted in a violation. In the rural stratum, none of the 23 (0.0%) inspections resulted in a violation.

Conclusions and Recommendations

Synar Inspection Study

The FFY 2018 (calendar year 2017) Synar RVR was 4.6%. The violation rate is below SAMHSA's 20% threshold and a return to a low RVR after the high RVR in 2016 (FFY 2017). WYSAC met SAMHSA's precision requirement of a 3% or smaller margin of error (SAMHSA, 2016) and SAMHSA requirements of having a balance of inspections completed by youth of each gender and youth of each age (16 or 17).

The RVR for cigarettes was 3.4%, statistically significantly lower than the RVR of 7.2% for smokeless tobacco. Overall, and for cigarette inspections, violations were more likely to occur in rural outlets. For smokeless tobacco inspections, however, the difference between strata was not statistically significant.

As it has been since 2007 (WYSAC 2017a), clerks not asking for identification was the strongest predictor of violations. Overall, the odds of a clerk violating when not asking for identification were 153.0 times higher than when asking for identification. Only two clerks (one cigarette inspection and one smokeless tobacco inspection)⁷ asked for identification and then committed a violation by being willing to sell the tobacco product. Educational efforts to encourage clerks to ask all customers for identification when selling tobacco products are likely the most successful way to influence youth ability to purchase tobacco products.

ENDS Pilot Study

As in 2016 (WYSAC, 2017a), the 2017 unweighted violation rates for the Synar and ENDS inspections were roughly similar to each other, including the substantial drops in violation rates from 2016 to 2017. The more important consideration for integrating ENDS into official Synar inspections is the consistent difficulty in completing ENDS inspections under the current protocol.

Inspection teams were able to complete 55.3% of the sample attempted ENDS inspections. This overall, unweighted completion rate is much worse than for Synar (85.5%). Nearly one fourth (24.6%) of the sampled ENDS outlets were eligible for the Synar inspections but ineligible for the ENDS Pilot Study because they did not sell ENDS products. Therefore, ENDS availability is the primary factor in the relatively poor completion rate. This is despite a change to the training protocol that could have increased the completion rate. Drivers were trained to have youth ask for other brands of similar products (e.g., MarkTen) when needed to complete an inspection. The drivers only noted one instance where this tactic helped complete an inspection, versus generally noting that the outlet did not sell any ENDS products if they did not sell VUSE or blu.

During the Synar inspections for cigarettes and smokeless tobacco, youth looked for whether ENDS were accessible to customers without asking the clerk. This protocol also serves as a visual inspection for the presence of ENDS in Synar-eligible retailers. Youth noted the location of ENDS in 32.5% of the completed Synar inspections. Because the transaction for a Synar inspection may not allow minors sufficient time for a thorough visual inspection for ENDS, the results could underestimate the availability of ENDS in Synar-eligible retailers. Still, the fact

⁷ Unweighted frequencies.

that it is a low percentage provides additional evidence that these products are often unavailable in Wyoming's Synar-eligible retailers.

It is possible that stores carried refill juice for more advanced ENDS products, but youth did not notice them and clerks did not offer them as an alternative. WYSAC (2017b) conducted focus groups of Wyoming teenagers and found that youth seem more likely to use next-generation vaping devices than the types of ENDS included in the ENDS Pilot Study protocol. These devices, generally called mods, are rechargeable, refillable devices that are generally more expensive as an initial investment. Rather than using disposable refill cartridges for an existing device (as with VUSE), mods have refillable tanks. The liquid, e-juice, used to refill them is generally sold at specialized vape shops. WYSAC recommends incorporating youth-accessible vape shops into the ENDS Pilot Study protocol and adding this type of refill to inspections at Synar-eligible retailers (assuming availability).

For the completed inspections, 36.5% were for disposable ENDS products. This compares to 47% in 2016 (WYSAC, 2017a). Nearly two thirds (63.5%) were for ENDS refill cartridges. This compares to 52.9% in 2016 (WYSAC, 2017a). In 2016, drivers were allowed to use their own discretion to maintain an even balance between disposable and refill inspections. In 2017, each ENDS inspection was assigned to be either a disposable inspection or refill inspection (with disposable as a backup). Because the proportion of completed inspections for disposable products was low in 2017 and 2016, it is possible that these products have relatively low market share in Wyoming. If this market share is decreasing, that may make it more difficult to complete ENDS inspections over time, given the protocol to use them as an alternative product when refill cartridges are not available.

ENDS inspection teams were less likely to complete inspections in rural outlets than urban outlets. Because Synar inspections often encounter a similar stratification difference in completion rates, incorporating ENDS inspections into official Synar work would compound the problems. If PHD opts to include ENDS in official Synar work, WYSAC recommends using combined accuracy and completion rates and an increased safety margin to calculate the target sample size. SAMHSA would need to approve such changes to the sampling procedure and might be able to recommend an adequate safety margin. This change would result in greater costs for completing the federally-mandated Synar work. An option to consider would be for youth inspectors to ask for the cigarettes that are part of the Synar protocol when ENDS are not available. This approach should minimize the number of incomplete inspections, but would limit any examination of violation rates for ENDS. If the shift in product arouses clerks' suspicions, this approach may also artificially lower the RVR.

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Appendices

Appendix A. 2017 (FFY 2018) Synar Inspection Study and ENDS Pilot Study Script

The adult supervisors trained the youth inspectors to follow the protocol below.

Script and instructions:

Please practice this script with your supervisor until you feel comfortable attempting your first purchase.

In two out of three inspections, you will ask for cigarettes. Before you go into the store, your supervisor will let you know what to ask for. If you're asking for cigarettes, follow this script:

If the cigarettes are within reach:

Select a pack of Marlboro Golds and place it on the counter.

If the cigarettes are behind the counter:

Say: "I'd like a pack of Marlboro Golds."

If the store does not have Marlboro Golds:

Young women pick up a pack of Camel Blues or ask: "How about a pack of Camel Blues?"

Young men pick up a pack of Camels or ask: "How about a pack of Camels?"

If the store has none of these options:

Say: "Then whatever you've got."

If the clerk asks for ID:

Say: "I don't have any ID with me."

If the clerk asks your age:

Be truthful in telling your age.

If the clerk asks who the tobacco is for:

Say: "For me."

If the clerk refuses to sell (they might say something like, "Sorry, I can't sell that to you."):

Leave the store.

If the clerk offers to sell (they ring up the purchase and wait for your money):

Fumble in your pocket and produce only one dollar, then say, "I don't have enough money, never mind," or "Sorry, I thought this was a \$10 bill," then leave the store.

If another customer offers to buy the cigarettes for you:

Say: "No, thank you," then leave the store.

For every third inspection, you will ask for smokeless tobacco (chew), instead of cigarettes. Before you go into the store, your supervisor will let you know what to ask for. If you're asking for smokeless tobacco, follow this script:

If the smokeless tobacco is within reach:

Select a can of Skoal Wintergreen and place it on the counter.

If the smokeless tobacco is behind the counter:

Say: "I'd like a can of Skoal Wintergreen."

If the store does not have Skoal:

Pick up a can of Copenhagen Wintergreen or ask, "How about a can of Copenhagen Wintergreen?"

For either brand, if the clerk asks what cut you want (likely a choice between long cut and fine cut)" Say: "Long cut."

If the store has none of these options: Say: "Then whatever you've got."

If the clerk asks for ID:

Say: "I don't have any ID with me."

If the clerk asks your age:

Be truthful in telling your age.

If the clerk asks who the tobacco is for:

Say: "For me."

If the clerk refuses to sell (they might say something like, "Sorry, I can't sell that to you."):

Leave the store.

If the clerk offers to sell (they ring up the purchase and wait for your money):

Fumble in your pocket and produce only one dollar, then say, "I don't have enough money, never mind," or "Sorry, I thought this was a \$10 bill," then leave the store.

If another customer offers to buy the chew for you:

Say: "No, thank you," then leave the store.

After every smokeless tobacco inspection, the other youth will ask for an e-cigarette or vapor product. Before you go into the store, your supervisor will let you know what to ask for. If you're asking for a disposable e-cigarette, follow this script: Note: You are asking for devices, not the refill packs.

If the e-cigarettes are within reach:

Pick up a blu disposable cherry flavor and place it on the counter.

If the e-cigarettes are behind the counter:

Say: "I'd like a blu cherry."

If the store does not have blu cherry: accept an offer of blu menthol or ask for the menthol. If neither is an option,

Pick up a VUSE Solo menthol flavor kit or ask "How about VUSE menthol?" (If needed, ask for the Solo VUSE.

If the store sells e-cigarettes but has none of these options: and the clerk offers you an alternative brand or product, ask for the first one they offer. Otherwise, say "Thank you" and leave the store.

If the store does not sell e-cigarettes, even if it sells refill liquid, say "thank you" and leave the store.

If the clerk asks for ID:

Say: "I don't have any ID with me."

If the clerk asks your age:

Be truthful in telling your age.

If the clerk asks who the product is for:

Say: "For me."

If the clerk refuses to sell (they might say something like, “Sorry, I can’t sell that to you.”):

Leave the store.

If the clerk offers to sell (they ring up the purchase and wait for your money):

Fumble in your pocket and produce only one dollar, then say, “I don’t have enough money, never mind,” or “Sorry, I thought this was a \$20 bill,” then leave the store.

If another customer offers to buy the product for you:

Say: “No, thank you,” then leave the store.

After every smokeless tobacco inspection, the other youth will ask for an e-cigarette or vapor product. Before you go into the store, your supervisor will let you know what to ask for. If you’re asking for a refill, follow this script:

If the e-juice is within reach:

Select a berry flavor VUSE Solo refill and place it on the counter.

If the e-juice is behind the counter:

Say: “I’d like a berry refill for a VUSE Solo.”

If the store does not have berry refills for VUSE Solo:

If the store sells e-juice for VUSE Solo but not berry:

Accept the first alternative flavor the clerk offers or ask: "What flavors do you have?" accept an offer of a mint, crema, chai, or menthol. As a last resort, accept an offer of a tobacco flavor.

If the clerk offers you a new VUSE Solo kit instead of e-juice,

Pick up a blu disposable cherry or ask: "How about a disposable blu cherry?"

If the store does not sell VUSE e-juice or blu disposable e-cigarettes, even if it sells other brands, say thank you and leave the store.

If the clerk asks for ID:

Say: "I don't have any ID with me."

If the clerk asks your age:

Be truthful in telling your age.

If the clerk asks who the product is for:

Say: "For me."

If the clerk refuses to sell (they might say something like, "Sorry, I can't sell that to you.):

Leave the store.

If the clerk offers to sell (they ring up the purchase and wait for your money):

Fumble in your pocket and produce only one dollar, then say, "I don't have enough money, never mind," or "Sorry, I thought this was a \$10 bill," then leave the store.

If another customer offers to buy the product for you:

Say: “No, thank you,” then leave the store.

If you have any additional questions concerning the research study, please contact the Principal Investigator, Laran Despain, at (307) 766-2342 or LDespain@uwyo.edu.

Appendix B. 2017 (FFY 2018) Synar Inspection and ENDS Pilot Study Detailed Results

WYSAC provides frequencies and percentages for every question on the 2017 (FFY 2018) Synar Inspection Form in this appendix. Results are separated by the Synar Inspection Study and ENDS Pilot Study. Because of rounding, not all percentages add to 100.0%. Reported percentages in this appendix may differ from those reported in the body of the report because analyses in the body of the report omitted outlets with missing data on specific items. For example, if a youth inspector did not report the age of the clerk, it is treated as missing data in this appendix and was not included in the analysis testing for an association between age of the clerk and violation. For missing data, WYSAC provides unweighted frequencies in the tables below.

SYNAR INSPECTION STUDY

For every question on the 2017 (FFY 2018) Synar Inspection Form, WYSAC provides the unweighted frequencies, unweighted percentages, and weighted percentages (except items 7 and 8, which ask about eligibility and inspection status, respectively) in this appendix. Of the 338 outlets in the sample, 302 were *eligible* (see items 7 and 7a). Another 13 outlets were coded as eligible, but *not inspected* (see items 8 and 8a). Thus, WYSAC has a total of 289 inspected outlets for inclusion in analyses. For questions 7 and 8, WYSAC provides information on all 338 stores in the sample and does not provide weighted percentages because part of the weighting accounts for ineligible outlets and incomplete inspections. For every other question, WYSAC only reports information for the 289 stores included in the analyses.

1: Inspection month

	Frequency	Valid, unweighted percent	Valid, weighted percent
July	157	54.0	56.4
August	132	45.7	43.6
Valid total	289	100.0	100.0

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2: Time of visit

	Frequency	Valid, unweighted percent	Valid, weighted percent
AM	79	28.0	27.3
PM	203	72.0	72.2
Valid total	282	100.0	100.0
No answer	7		
Total	289		

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3: Gender of youth inspector

	Frequency	Valid, unweighted percent	Valid, weighted percent
Boy	141	48.8	51.5
Girl	148	51.2	48.5
Valid total	289	100.0	100.0

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4: Age of youth inspector

	Frequency	Valid, unweighted percent	Valid, weighted percent
Stores inspected by 16-year-olds	145	50.2	50.7
Stores inspected by 17-year-olds	144	49.8	49.3
Valid total	289	100.0	100.0

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5: Outlet Stratum

	Frequency	Valid, unweighted percent	Valid, weighted percent
Rural	139	48.1	28.1
Urban	150	51.9	71.9
Valid total	289	100.0	100.0

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6: Outlet county

	Frequency	Valid, unweighted percent	Valid, weighted percent
Albany	14	4.8	5.9
Big Horn	10	3.5	2.0
Campbell	14	4.8	5.9
Carbon	19	6.6	6.1
Converse	10	3.5	3.1
Crook	14	4.8	2.8
Fremont	22	7.6	8.1
Goshen	5	1.7	2.1
Hot Springs	6	2.1	1.2
Johnson	9	3.1	3.8
Laramie	24	8.3	10.7
Lincoln	20	6.9	4.0
Natrona	25	8.7	10.6
Niobrara	4	1.4	0.8
Park	7	2.4	3.4
Platte	9	3.1	2.9
Sheridan	8	2.8	2.7
Sublette	12	4.2	2.4
Sweetwater	20	6.9	8.2
Teton	13	4.5	4.6
Uinta	11	3.8	3.3
Washakie	7	2.4	3.1
Weston	6	2.1	2.3
Valid total	289	100.0	100.0

WYOMING SURVEY & ANALYSIS CENTER

7: Was the outlet (store) eligible for inspection?

	Frequency	Valid, unweighted percent
Yes	302	89.3
No	36	10.7
Valid total	338	100.0

Note: Includes all tobacco retailers in the sample, unlike the majority of tables in this appendix.

WYOMING SURVEY & ANALYSIS CENTER

7a: If NO, mark one of the following reasons the store was ineligible for inspection:

	Frequency	Valid, unweighted percent
Inaccessible to youth	6	16.7
Out of business	4	11.1
Does not sell tobacco products	22	61.1
Could not locate	2	5.6
Duplicate	2	5.6
Valid total	36	100.0

Note. Includes only the 36 ineligible tobacco retailers from item 7, unlike the majority of tables in this appendix.

WYOMING SURVEY & ANALYSIS CENTER

8: If outlet is eligible, was inspection completed?

	Frequency	Valid, unweighted percent
Yes	289	95.7
No	13	4.3
Valid total	302	100.0
Ineligible	36	
Total	338	

Note. Includes all tobacco retailers in the sample, unlike the majority of tables in this appendix.

WYOMING SURVEY & ANALYSIS CENTER

8a: If NO, mark one of the following reasons the inspection was not completed:

	Frequency	Valid, unweighted percent
In operation, but closed at time of visit	2	15.4
Both youth inspectors knew someone in the store	1	7.7
Tobacco out of stock	2	15.4
Other (specify)	8	61.5
Valid total	13	100.0

Note. Includes only the 13 uninspected, eligible tobacco retailers from item 8.

Other reasons:

- Lack of law enforcement support (6)
- Salesperson did not speak English (1)
- Driver error (1)

WYOMING SURVEY & ANALYSIS CENTER

9: Type of store

	Frequency	Valid, unweighted percent	Valid, weighted percent
Convenience (no gas)	6	2.1	1.5
Convenience (with gas)	183	63.3	65.1
Grocery store	45	45.6	66.5
Discount/ Superstore (e.g., Wal-Mart, Target)	11	3.8	81.2
Drug Store	3	1.0	66.5
Tobacco store	4	1.4	87.5
Restaurant / Cafe	3	1.0	88.4
Other (specify):	34	11.8	100.0
Total	289	100.0	100.0

“Other” responses:

- Auto Repair (1)
- Bar (7)
- Bingo Hall (1)
- Bowling Alley (1)
- Casino (2)
- Fireworks & Convenience store (1)
- Grill and Convenience store (1)
- Dollar Store (13)
- Garage (1)
- Gas and Gift Shop (1)
- Liquor Store (1)
- Lodge (1)
- Resort (1)
- Smoking and Gas Store (1)

WYSAC included stores that were labeled as ineligible types of retailers (e.g., liquor store) under the assumption that the subjective store type was some combination of an eligible type and ineligible type.

WYOMING SURVEY & ANALYSIS CENTER

10: Location of cigarettes

	Frequency	Valid, unweighted percent	Valid, weighted percent
Accessible (customers can pick up a pack of cigarettes without the assistance of an employee)	10	3.9	3.8
Not accessible (customers require assistance from an employee to obtain cigarettes)	247	96.1	96.2
Valid total	257		
No answer	32		
Total	289		

WYOMING SURVEY & ANALYSIS CENTER

11: Location of smokeless tobacco

	Frequency	Valid, unweighted percent	Valid, weighted percent
Accessible (customers can pick up a package of smokeless tobacco without the assistance of an employee)	7	3.4	2.8
Not accessible (customers require assistance from an employee to obtain smokeless tobacco)	197	96.6	97.2
Valid total	204	100.0	100.0
Youth inspector could not locate	24		
No answer	61		
Total	289		

WYOMING SURVEY & ANALYSIS CENTER

12: Location of vapor products [ENDS]

	Frequency	Valid, unweighted percent	Valid, weighted percent
Accessible (customers can pick up ENDS without the assistance of an employee)	12	12.8	14.3
Not accessible (customers require assistance from an employee to obtain ENDS)	82	87.2	85.7
Valid total	94	100.0	100.0
Youth inspector could not locate	114		
No answer	81		
Total	289		

WYOMING SURVEY & ANALYSIS CENTER

Overall tobacco accessibility

WYSAC constructed this variable from responses to items 10 through 12 above.

	Frequency	Valid, unweighted percent	Valid, weighted percent
Cigarettes and/or smokeless tobacco and/or ENDS accessible (customers can pick up at least one type of tobacco product without the assistance of an employee)	24	23.1	22.1
No cigarettes, smokeless tobacco, or ENDS accessible (customers require assistance from an employee to obtain all types of tobacco products)	80	76.9	77.9
Valid total	104	100.0	100.0
Missing data (youth inspector could not locate or no answer)	185		
Total	289		

Note. Youth inspectors asked for a specific type of tobacco product (cigarettes, smokeless tobacco, or ENDS) and were trained to look for the other types of tobacco product during each inspection, though they were not always able to see displays for all tobacco types. For example, a youth may not have noticed an ENDS display during a cigarette inspection if it was out of their line of site during a quick transaction. In such cases, “youth inspector could not locate” would not be a valid indicator of that product’s accessibility in that retailer, so WYSAC treats that response as missing.

WYOMING SURVEY & ANALYSIS CENTER

13: Were there any youth access signs present in the store (e.g., “No Sales to Minors”)?

	Frequency	Valid, unweighted percent	Valid, weighted percent
Yes	223	79.1	79.5
No	59	20.9	20.0
Valid total	282	100.0	100.0
No answer	7		
Total	289		

WYOMING SURVEY & ANALYSIS CENTER

14: Clerk gender

	Frequency	Valid, unweighted percent	Valid, weighted percent
Man	95	32.9	33.6
Woman	194	67.1	66.4
Total	289	100.0	100.0

WYOMING SURVEY & ANALYSIS CENTER

15: Approximate age of clerk

	Frequency	Valid, unweighted percent	Valid, weighted percent
Under 18	1	0.3	0.5
18-24	55	19.1	19.0
25-34	72	25.0	26.6
35-44	64	22.2	22.2
45-54	49	17.0	16.1
55-64	34	11.8	12.2
65-85	13	4.5	3.5
Valid total	288	100.0	100.0
No answer	1		
Total	289		

WYOMING SURVEY & ANALYSIS CENTER

16: If inspection was completed, was buy attempt successful?

	Frequency	Valid, unweighted percent	Valid, weighted percent
Yes (violation)	15	5.2	4.4
No (nonviolation)	274	94.8	95.6
Valid total	289	100.0	100.0

Note. Although WYSAC verified that the SPSS analyses replicated the SSES output for Table 2, with the numbers of completed inspections, eligible outlets, sampled outlets, and population outlets in total and each stratum, the weighting calculations in SPSS resulted in a slightly different RVR than the weighting calculation in SSES.

WYOMING SURVEY & ANALYSIS CENTER

16a. If YES, how much was the pack/can?

	Frequency	Valid, unweighted percent	Valid, weighted percent
\$4.50-\$4.99	3	18.8	19.1
\$5.00-\$5.49	3	18.8	25.1
\$5.50-\$8.50	10	62.5	55.7
Valid total	16	100.0	100.0
No answer	273		
Total	289		

Note: Data for this table include recorded prices for nonviolations.

WYOMING SURVEY & ANALYSIS CENTER

Recorded price for a pack of cigarettes

WYSAC constructed this variable from responses to items 16a and 17.

	Frequency	Valid, unweighted percent	Valid, weighted percent
\$4.50-\$4.99	2	18.2	11.1
\$5.00-\$5.49	1	9.1	16.7
\$5.50-\$8.50	8	72.7	72.2
Valid total	11	100.0	

Note: Data for this table include recorded prices for nonviolations.

WYOMING SURVEY & ANALYSIS CENTER

Recorded price for a package of smokeless tobacco

WYSAC constructed this variable from responses to items 16a and 17.

	Frequency	Valid, unweighted percent	Valid, weighted percent
\$4.50-\$4.99	1	20.0	33.3
\$5.00-\$5.49	2	40.0	44.4
\$5.50-\$8.50	2	40.0	22.2
Valid total	5	100.0	

Note: Data for this table include recorded prices for nonviolations.

WYOMING SURVEY & ANALYSIS CENTER

17: What type of tobacco did the youth inspector ask for? (Every third inspection should be for smokeless tobacco.)

	Frequency	Valid, unweighted percent	Valid, weighted percent
Cigarettes	206	71.3	71.3
Smokeless tobacco	83	28.7	28.7
Valid total	289	100.0	100.0

WYOMING SURVEY & ANALYSIS CENTER

18: What tobacco brand was attempted to be purchased?

Type of tobacco	Brand of tobacco product	Frequency	Valid, unweighted percent	Valid, weighted percent
Cigarettes	Marlboro Gold	137	47.4	47.7
	Camel Blue	42	14.5	13.8
	Camel	18	6.2	6.7
	Other	8	2.8	2.4
	No answer	1	0.3	0.5
Smokeless tobacco	Skoal Wintergreen	49	17.0	17.4
	Copenhagen Wintergreen	33	11.4	11.1
	Other	1	0.3	0.5
Valid total		289	100.0	100.0

“Other” responses:

- Marlboro 100s (8)
- Copenhagen Snuff (1)

WYOMING SURVEY & ANALYSIS CENTER

19: Did the clerk ask for youth’s ID?

	Frequency	Valid, unweighted percent	Valid, weighted percent
Yes	266	92.7	92.9
No	21	7.3	7.1
Total	289	100.0	100.0

WYOMING SURVEY & ANALYSIS CENTER

20: Did the clerk ask for youth's age?

	Frequency	Valid, unweighted percent	Valid, weighted percent
Yes	261	5.8	5.1
No	2	94.2	94.9
Valid total	277	100.0	100.0
No answer	12		
Total	289		

WYOMING SURVEY & ANALYSIS CENTER

ENDS PILOT STUDY

Of the 114 outlets in the sample, 67 were *eligible* (see items 7 and 7a). Another four outlets were coded as eligible, but *not inspected* (see items 8 and 8a). Thus, WYSAC has a total of 63 inspected outlets for inclusion in analyses. For every question (except for 7 and 8), WYSAC only reports information for the 63 stores included in the analyses. For questions 7 and 8, WYSAC provides information on all 114 stores in the sample. For the ENDS Pilot Study, WYSAC does not provide weighted percentages because it would not be appropriate to weight the results to account for the sampling procedure used for the Synar Inspection Study.

1: Inspection month

	Frequency	Valid, unweighted percent
July	35	55.6
August	28	44.4
Valid total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

2: Time of visit

	Frequency	Valid, unweighted percent
AM	19	31.1
PM	42	68.9
Valid total	61	100.0
No answer	2	
Total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

3: Gender of youth inspector

	Frequency	Valid, unweighted percent
Stores inspected by boys	36	57.1
Stores inspected by girls	27	42.9
Valid total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

4: Age of youth inspector

	Frequency	Valid, unweighted percent
Stores inspected by 16-year-olds	32	50.8
Stores inspected by 17-year-olds	31	49.2
Valid total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

5: Outlet Stratum

	Frequency	Valid, unweighted percent
Rural	18	28.6
Urban	45	71.4
Valid total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

6: Outlet county

	Frequency	Valid, unweighted percent
Albany	3	5.3
Big Horn	0	1.8
Campbell	6	6.1
Carbon	4	7.9
Converse	2	4.4
Crook	0	1.8
Fremont	8	9.6
Goshen	0	0.9
Hot Springs	1	2.6
Johnson	1	1.8
Laramie	8	8.8
Lincoln	1	2.6
Natrona	10	11.4
Niobrara	2	1.8
Park	2	5.3
Platte	2	2.6
Sheridan	4	5.3
Sublette	1	4.4
Sweetwater	2	4.4
Teton	3	5.3
Uinta	2	3.5
Washakie	0	0
Weston	1	2.6
Valid total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

7: Was the outlet (store) eligible for inspection?

	Frequency	Valid, unweighted percent
Yes	67	58.8
No	47	41.2
Valid total	114	100.0

Note: Includes all tobacco retailers in the sample, unlike the majority of tables in this appendix.

WYOMING SURVEY & ANALYSIS CENTER

7a: If NO, mark one of the following reasons the store was ineligible for inspection:

	Frequency	Valid, unweighted percent
Synar eligible, does not sell ENDS products	28	59.6
Out of business	3	6.4
Does not sell tobacco products	10	21.3
Inaccessible to youth	4	8.5
Can't be located	1	2.1
Duplicate	1	2.1
Valid total	47	100.0

Note. Includes only the 47 ineligible tobacco retailers from item 7, unlike the majority of tables in this appendix.

WYOMING SURVEY & ANALYSIS CENTER

8: If outlet is eligible, was inspection completed?

	Frequency	Valid, unweighted percent
Yes	63	94.0
No	4	6.3
Valid total	67	100.0
Ineligible	47	
Total	114	

Note. Includes all tobacco retailers in the sample, unlike the majority of tables in this appendix.

WYOMING SURVEY & ANALYSIS CENTER

8a: If NO, mark one of the following reasons the inspection was not completed:

	Frequency	Valid, unweighted percent
Both youth inspectors knew someone in the store	2	50.0
Lack of law enforcement support	2	50.0
Valid total	4	100.0

Note. Includes only the 4 uninspected, eligible tobacco retailers from item 8.

WYOMING SURVEY & ANALYSIS CENTER

9: Type of store

	Frequency	Valid, unweighted percent
Convenience (with gas)	44	66.2
Grocery store	5	76.6
Discount/ Superstore (e.g., Wal-Mart, Target)	4	5.2
Tobacco store	3	3.9
Drug Store	1	1.3
Restaurant / Cafe	1	2.6
Other (specify):	5	11.7
Valid total	63	100.0

Other responses:

- Auto Repair (1)
- Casino (1)
- Dollar store (1)
- Gas and Thrift Shop (1)
- Liquor Store (1)

WYSAC included stores that were labeled as ineligible types of retailers (e.g., liquor store) under the assumption that the subjective store type was some combination of an eligible type and ineligible type.

WYOMING SURVEY & ANALYSIS CENTER

10: Location of cigarettes

	Frequency	Valid, unweighted percent
Accessible (customers can pick up a pack of cigarettes without the assistance of an employee)	3	6.3
Not accessible (customers require assistance from an employee to obtain cigarettes)	45	93.8
Valid total	48	100.0
Youth Inspector could not locate	3	
No answer	12	
Total	63	

WYOMING SURVEY & ANALYSIS CENTER

11: Location of smokeless tobacco

	Frequency	Valid, unweighted percent
Accessible (customers can pick up a package of smokeless tobacco without the assistance of an employee)	1	2.1
Not accessible (customers require assistance from an employee to obtain smokeless tobacco)	46	97.9
Valid total	47	100.0
Youth inspector could not locate	4	
No answer	12	
Total	63	

WYOMING SURVEY & ANALYSIS CENTER

12: Location of vapor products [ENDS]

	Frequency	Valid, unweighted percent
Accessible (customers can pick up ENDS without the assistance of an employee)	5	8.8
Not accessible (customers require assistance from an employee to obtain ENDS)	52	91.2
Valid total	57	100.0
Youth inspector could not locate	6	
Total	63	

WYOMING SURVEY & ANALYSIS CENTER

Overall tobacco accessibility

WYSAC constructed this variable from responses to items 10 through 12 above.

	Frequency	Valid, unweighted percent
Cigarettes and/or smokeless tobacco and/or ENDS accessible (customers can pick up tobacco products without the assistance of an employee)	39	84.8
Neither cigarettes nor smokeless tobacco nor ENDS accessible (customers require assistance from an employee to obtain tobacco products)	7	15.2
Valid total	46	100.0
Missing data (youth inspector could not locate one tobacco type)	17	
Total	63	

Note. Youth inspectors asked for a specific type of tobacco product (cigarettes, smokeless tobacco, or ENDS) and were trained to look for the other types of tobacco product during each inspection, though they were not always able to see displays for all tobacco types. For example, a youth may not have noticed an ENDS display during a cigarette inspection if it was out of their line of site during a quick transaction. In such cases, “youth inspector could not locate” would not be a valid indicator of that product’s accessibility in that retailer, so WYSAC treats that response as missing.

WYOMING SURVEY & ANALYSIS CENTER

13: Were there any youth access signs present in the store (e.g., “No Sales to Minors”)?

	Frequency	Valid, unweighted percent
Yes	55	87.3
No	8	12.7
Total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

14: Clerk gender

	Frequency	Valid, unweighted percent
Man	18	28.6
Woman	45	71.4
Total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

15: Approximate age of clerk

	Frequency	Valid, unweighted percent
18-24	8	12.7
25-34	18	28.6
35-44	16	25.4
45-54	16	25.4
55-64	4	6.3
65-85	1	1.6
Valid total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

16: If inspection was completed, was buy attempt successful?

	Frequency	Valid, unweighted percent
Yes (violation)	3	4.8
No (nonviolation)	60	95.2
Valid total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

16a. If YES, how much was the product?

	Frequency	Valid, unweighted percent
\$5.50-\$8.50	5	100.0
Valid total	5	100.0
No answer	58	
Total	63	

Note: Data for this table include recorded prices for nonviolations.

WYOMING SURVEY & ANALYSIS CENTER

17: What type of tobacco did the youth inspector ask for?

	Frequency	Valid, unweighted percent
E-cigarette	23	36.5
E-juice	40	63.5
Valid total	63	100.0

WYOMING SURVEY & ANALYSIS CENTER

18: What tobacco brand was attempted to be purchased?

Brand of tobacco product	Frequency	Valid, unweighted percent
Blu disposable	23	37.1
VUSE refill	38	61.3
Other	1	1.6
Valid total	62	100.0
No answer	1	
Total	63	

“Other” response:

— Refill (1)

WYOMING SURVEY & ANALYSIS CENTER

19: Did the clerk ask for youth's ID?

	Frequency	Valid, unweighted percent
Yes	4	6.6
No	57	93.4
Valid total	61	100.0
No answer	2	
Total	63	

WYOMING SURVEY & ANALYSIS CENTER

20: Did the clerk ask for youth's age?

	Frequency	Valid, unweighted percent
Yes	8	13.8
No	50	86.2
Valid total	58	100.0
No answer	5	
Total	63	

WYOMING SURVEY & ANALYSIS CENTER

Appendix C. Detailed Calculations for the 2017 (FFY 2018) Synar Inspection Study

APPENDIX C.1. INSPECTION STUDY SAMPLING DESIGN

Table C-1 provides information on the sample sizes for the two strata, depicting input for and output from the SSES Sample Size Calculator. WYSAC entered several variables (under “Input Information” in Table C-1) into SSES to obtain the rural and urban sample sizes. An explanation of each input variable follows:

One-sided option for 95% Confidence Interval meets the same precision requirement with a smaller sample size than the two-sided choice.

Outlet Frame Size represents the total population of tobacco retail stores on the list frame. Because WYSAC conducted the sample size calculations separately for each stratum, the outlet frame size is specific to the stratum (rural or urban).

Expected Retailer Violation Rate (RVR) is the expected RVR from the average of the three previous years. The expected RVR is specific for each stratum.

Design Effect. The design effect normally accounts for the loss of effectiveness by using a sampling design other than a simple random sample. Because WYSAC conducted the sample size calculations separately and conducted a simple random sample within each stratum, the design effect for each stratum is 1.

Expected Accuracy Rate is the percentage of outlets whose information was accurate on the list frame, using the average of the three previous years. This rate provides an estimate of the proportion of outlets on the list frame that are eligible for the Synar survey. This percentage is specific to each stratum.

Expected Completion Rate is the average of the three previous years’ percentage of stores inspected by inspection teams. The numerator is the percentage of outlets visited; the denominator is the number of eligible outlets. This percentage is specific to each stratum.

Safety Margin Used is the percentage by which the sample size is inflated to ensure a large enough sample size. A safety margin allows WYSAC to account for ineligible outlets (e.g., businesses that had closed) on the list frame. WYSAC uses a safety margin of 20.0% for each stratum.

Once WYSAC entered this information, SSES provided three outputs: effective sample size, target sample size, and planned original sample size for each strata. Definitions for each of these outputs follow. Numerical values are in Table C-1.

Effective Sample Size is the sample size needed to meet the SAMHSA precision requirement under simple random sampling.

Target (Minimum) Sample Size is the sample size needed to achieve the desired precision requirement with a complex sampling design. This number is the product of the effective sample size and the design effect. Because the design effect for each strata is 1, the effective sample size is the same as the target sample size.

Planned Original Sample Size is the actual sample size WYSAC used to draw the sample. To compute this number, SSES inflates the target sample size using the accuracy and completion rates and incorporates the safety margin.

Table C-1: SSES Sample Size Outputs for the Sampling Frame

Synar Survey		
State and stratum	rural WY	urban WY
FFY	2018	2018
Date	6/16/2017 14:42	6/16/2017 14:48
Input Information		
Option for 95% Confidence Interval	One-Sided	One-Sided
Outlet Frame Size	192	436
Expected Retailer Violation Rate	10.10%	6.10%
Design Effect	1	1
Expected Accuracy Rate	91.20%	87.80%
Expected Completion Rate	92.90%	95.90%
Safety Margin Used	20%	20%
Sample Size		
Effective Sample Size	113	124
Target(Minimum) Sample Size	113	124
Planned Original Sample Size	161	177

WYOMING SURVEY & ANALYSIS CENTER

Based on the average of the 2015–2017 (FFY 2016–2018) Synar results, the input values for the FFY 2019 (calendar year 2018) Synar inspections are as follows:

- Rural stratum
 - Expected RVR = $(7.2+12.4+7.3)/3 = 9.0\%$
 - Expected accuracy rate = $(92.5+86.2+96.4)/3 = 91.7\%$
 - Expected completion rate = $(93.3+88.2+92.5)/3 = 91.3\%$
- Urban stratum
 - Expected RVR = $(3.3+11.4+2.8)/3 = 5.8\%$
 - Expected accuracy rate = $(86.4+83.0+90.0)/3 = 86.5\%$
 - Expected completion rate = $(98.0+89.7+100.0)/3 = 95.9\%$

APPENDIX C.2. RVR CALCULATIONS

WYSAC estimated the number of total outlets eligible for inspection in the list frame by

$$N_{urban} \left(\frac{n_{1\ urban}}{n_{urban}} \right) + N_{rural} \left(\frac{n_{1\ rural}}{n_{rural}} \right) = N_{total}$$

where

N_{total} = the estimated number of total outlets eligible for inspection in the list frame

N_{urban} = the number of urban stratum outlets on the list frame

$n_{1\ urban}$ = the number of outlets eligible for inspection within the urban stratum

n_{urban} = the number of outlets in the original sample within the urban stratum

N_{rural} = the number of rural stratum outlets on the list frame

$n_{1\ rural}$ = the number of outlets eligible for inspection within the rural stratum

n_{rural} = the number of outlets in the original sample within the rural stratum

This gives an estimated number of total outlets eligible for inspection:

$$436 \frac{153}{177} + 192 \frac{149}{161} = 554.571$$

WYSAC estimated the weighted RVR by

$$\left(\frac{x_{urban}}{n_{2\ urban}} \right) \left(\frac{n_{1\ urban}}{n_{urban}} \right) \left(\frac{N_{urban}}{N_{total}} \right) + \left(\frac{x_{rural}}{n_{2\ rural}} \right) \left(\frac{n_{1\ rural}}{n_{rural}} \right) \left(\frac{N_{rural}}{N_{total}} \right) = \text{weighted RVR}$$

Where, in addition to the variables defined above

x_{urban} = the number of noncompliant outlets within the urban stratum

$n_{2\ urban}$ = the number of outlets inspected within the urban stratum

x_{rural} = the number of noncompliant outlets within the rural stratum

$n_{2\ rural}$ = the number of outlets inspected within the rural stratum

Thus, the weighted noncompliance rate for the 2015 (FFY 2016) Synar Inspection Study was

$$\left(\frac{5}{150} \right) \left(\frac{153}{177} \right) \left(\frac{436}{554.571} \right) + \left(\frac{10}{139} \right) \left(\frac{149}{161} \right) \left(\frac{192}{554.571} \right) = .046 \text{ or } 4.6\%$$

APPENDIX C.3. ANALYSES OF ASSOCIATIONS WITH RETAILER VIOLATIONS

The tables on the following three pages present the results of WYSAC's analyses to examine the possible association between selected variables and retailer violations. WYSAC conducted these crosstab analyses in IBM SPSS Statistics version 24. Depending on the specific analysis, WYSAC used Pearson's chi-squared test or Fisher's exact test to identify statistically significant associations. Fisher's exact test is an alternative to Pearson's chi-squared test that provides more reliable results than Pearson's chi-squared in analyses when a crosstab only has a few observations in some of the conditions (e.g., no violations for cigarette inspections where cigarettes were accessible). As a general rule, Fisher's exact tests are preferred when more than 25% of conditions have fewer than five expected observations or when any condition has zero observations. WYSAC used one-tailed Fisher's exact tests because two-tailed tests (as were used with Pearson's chi squared) tend to be overly conservative (Agresti, 2007, pp. 45–48). In this appendix, WYSAC reports which test was used for each tested association, along with detailed statistical results. In the body of the report, WYSAC reports significant relationships when $p < .05$, suggesting that one can say with 95% confidence that the differences are not due to chance. WYSAC accounted for the stratified sample by analyzing weighted data for the statistical tests. ***Bold, italicized text*** in the tables indicates the three variables that showed statistically significant relationships with retailer violation for the full data set, cigarette inspections, and smokeless tobacco inspections. *Italicized text* in the tables indicates additional statistically significant findings.

Table C.3-1: Testing Associations with Retailer Violation: Cigarettes and Smokeless Tobacco, Combined

Full results of statistical tests

Variable	χ^2	Degrees of freedom	Weighted number of outlets included	Statistical significance (p)	Higher RVR situation*
<i>Ask for identification</i>	146.95	1	287	< .001	<i>Not asking for identification</i>
<i>Estimated clerk age, dichotomized</i>	14.10	1	573	< .001	<i>35 or younger</i>
<i>Month of inspection</i>	10.60	1	576	0.001	<i>July</i>
<i>Age rating of youth inspector, dichotomized</i>	6.75	1	575	0.009	<i>Looking younger than 18</i>
<i>Store type, dichotomized</i>	4.56	1	576	.033	<i>Convenience store with or without gas</i>
<i>Rural/Urban stratum</i>	4.41	1	577	0.036	<i>Rural</i>
<i>Type of tobacco</i>	4.02	1	577	0.045	<i>Smokeless tobacco</i>
Ask age	3.19	1	554	0.074	Asking for youth's age
Youth inspector age	2.26	1	576	0.133	17 years old
Time of inspection	0.13	1	564	0.714	Afternoon
Clerk gender	.06	1	576	0.80	Men
Youth inspector gender	0.06	1	576	0.812	Girls
Accessibility of any tobacco product, dichotomized	0.82	1	228	0.822	At least one tobacco product accessible
Youth access signs	0.00	1	561	0.967	None
Adult supervisor	0.02	2	576	0.991	One adult supervisor

* The higher RVR situation for nonsignificant associations is provided for informational purposes only

Note: The number of outlets included in analyses varies because of weighting and missing data. As in the report, WYSAC dichotomized youth inspector age ratings (18 or older vs. younger than 18), estimated clerk age (36 or older vs. 35 or younger), store type (convenience store with or without gas vs. all others), and tobacco accessibility (none accessible vs. at least some accessible). ***Bold, italicized text*** indicates the two variables that showed statistically significant relationships with retailer violation for the full data set, cigarette inspections, and smokeless tobacco inspections. *Italicized text* indicates additional statistically significant findings in this table.

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Table C.3-2: Testing Associations with Retailer Violation: Cigarettes Only

Full results of statistical tests

Variable	χ^2	Degrees of freedom	Weighted number of outlets included	Statistical significance (p)	Higher RVR situation*
<i>Ask for identification</i>	<i>189.10</i>	<i>1</i>	<i>407</i>	<i><.001</i>	<i>Not asking for identification</i>
<i>Estimated clerk age, dichotomized</i>	<i>4.94</i>	<i>1</i>	<i>410</i>	<i>.026</i>	<i>35 or younger</i>
<i>Month of inspection</i>	8.20	1	411	.004	<i>July</i>
<i>Ask age</i>	7.66	1	401	.006	<i>Asking for age</i>
<i>Youth inspector age</i>	6.44	1	410	.011	<i>17</i>
<i>Rural/Urban stratum</i>	6.12	1	411	.013	<i>Rural</i>
<i>Store type, dichotomized</i>	5.61	1	411	.018	<i>Convenience store</i>
Adult supervisor	2.47	2	411	.291	Two drivers
Time of inspection	1.03	1	402	.309	Morning
Accessibility of cigarettes	0.70	1	393	.404	Not accessible
Youth inspector gender	0.62	1	411	.433	Girls
Clerk gender	0.06	1	411	.801	Men
Youth access signs	0.05	1	404	.830	Signs
Age rating of youth inspector, dichotomized	0.03	1	411	.862	Under 18

* The higher RVR situation for nonsignificant associations is provided for informational purposes only

Note: The number of outlets included in analyses varies because of weighting and missing data. As in the report, WYSAC dichotomized youth inspector age ratings (18 or older vs. younger than 18), estimated clerk age (36 or older vs. 35 or younger), and store type (convenience store with or without gas vs. all others). ***Bold, italicized text*** indicates the two variables that showed statistically significant relationships with retailer violation for the full data set, cigarette inspections, and smokeless tobacco inspections. *Italicized text* indicates additional statistically significant findings in this table.

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Table C.3-3: Testing Associations with Retailer Violation: Smokeless Tobacco Only

Full results of statistical tests

Variable	χ^2	Degrees of freedom	Weighted number of outlets included	Statistical significance (p)	Higher RVR situation*
<i>Ask for identification</i>	<i>63.45</i>	<i>1</i>	<i>166</i>	<i><.001</i>	<i>Not asking for identification</i>
<i>Estimated clerk age, dichotomized</i>	<i>9.04</i>	<i>1</i>	<i>163</i>	<i>.003</i>	<i>35 or younger</i>
<i>Age rating of youth inspector, dichotomized</i>	<i>13.75</i>	<i>1</i>	<i>166</i>	<i><.001</i>	<i>Under 18</i>
Time of inspection	3.02	1	162	.082	Afternoon
Month of inspection	2.51	1	164	.113	July
Adult supervisor	3.21	2	166	.201	One driver
Ask age	0.52	1	154	.469	Not asking for age
Youth inspector age	0.16	1	165	.686	16
Store type, dichotomized	0.11	1	165	.746	Convenience store
Youth inspector gender	0.09	1	166	.766	Boys
Clerk gender	0.04	1	166	.833	Women
Accessibility of smokeless tobacco	Fisher's exact		150	.846	Not Accessible
Youth access signs	0.01	1	158	.936	No signs
Rural/Urban stratum	0.004	1	164	.953	Urban

* The higher RVR situation for nonsignificant associations is provided for informational purposes only

Note: The number of outlets included in analyses varies because of weighting and missing data. As in the report, WYSAC dichotomized youth inspector age ratings (18 or older vs. younger than 18), estimated clerk age (36 or older vs. 35 or younger), and store type (convenience store with or without gas vs. all others). ***Bold, italicized text*** indicates the two variables that showed statistically significant relationships with retailer violation for the full data set, cigarette inspections, and smokeless tobacco inspections. *Italicized text* indicates additional statistically significant findings in this table.

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Appendix D. Synar Inspection Form 2017 (FFY 2018)

The Synar Inspection Form for 2017 (FFY 2018) is on the following two pages. The same form was used for the Synar Inspection Study and ENDS Pilot Study.

Synar Inspection Form

Please complete this form as accurately as possible and write legibly.
Use pen or pencil to fill in circles completely, as shown.

Mark Answers Like This ➡ • ■
NOT Like This ➡ ✕ ✓

Inspection Date: (MM/DD/YY) / /

Time of Visit: ☐ AM ☐ PM

Youth Inspector

Gender: ☐ Male ☐ Female

Name: _____

Age:

Adult Supervisor

Name: _____

Outlet Information

ID:

Hand ID:

(for office use only)

Name: _____

Address: _____

City: _____

Stratum: ☐ Rural ☐ Urban

Updated outlet information or corrections? ☐ No ☐ Yes

If needed, mark changes in notes section on back.

Eligibility/Completion

Was the outlet (store) eligible for an inspection?

☐ Yes ☐ No



If **NO**, mark one of the following reasons the store was ineligible for inspection:

- | | |
|---|---|
| <input type="radio"/> Out of business | <input type="radio"/> Could not locate |
| <input type="radio"/> Does not sell tobacco products | <input type="radio"/> Wholesale only / carton sale only |
| <input type="radio"/> Inaccessible to youth | <input type="radio"/> Vending machine broken |
| <input type="radio"/> Private club / personal residence | <input type="radio"/> Duplicate |
| <input type="radio"/> Temporary closure | <input type="radio"/> Other (specify): _____ |
| <input type="radio"/> Moved to new location but not inspected | |

If outlet was eligible, was inspection completed?

☐ Yes ☐ No ☐ Ineligible



If **NO**, mark one of the following reasons the inspection was not completed:

- | | |
|---|--|
| <input type="radio"/> In operation, but closed at time of visit | <input type="radio"/> Drive through only |
| <input type="radio"/> Unsafe to access | <input type="radio"/> Tobacco out of stock |
| <input type="radio"/> Presence of police | <input type="radio"/> Ran out of time |
| <input type="radio"/> Both youth inspectors know someone in the store | <input type="radio"/> Other (specify): _____ |

Synar Inspection Form

General Store and Clerk Information

Type of Store:

- ☐ No gas ☐ Superstore (e.g., Wal-Mart, Target)
☐ Gas station ☐ Tobacco store
☐ Drug store ☐ Restaurant
☐ Grocery store ☐ Other (specify): _____

Location of:

Cigarettes

Chewing Tobacco

Vapor Products

Accessible (customers can pick up a pack of tobacco product without the assistance of an employee)

☐
☐
☐

Not Accessible (customers require assistance from an employee to obtain tobacco product)

☐
☐
☐

Youth Inspector Could Not Locate

☐
☐
☐

Were there any youth access signs present in the store? (e.g., "No Sales to Minors")

- ☐ Yes ☐ No

Clerk Gender:

- ☐ Male ☐ Female ☐ Don't know / Not sure

Approximate Age of Clerk:

--	--

If inspection was completed, was buy attempt successful?

- ☐ Yes (Violation) ☐ No (Nonviolation) ☐ Not Completed/Ineligible



If YES, how much was the product? \$ ____.

What type of tobacco did the youth inspector ask for? (Every third inspection should be for chewing tobacco.)

- ☐ Cigarettes ☐ Chewing Tobacco ☐ Disposable e-cigarette ☐ e-juice (refill)

What tobacco brand was attempted to be purchased?

- ☐ Copenhagen Wintergreen ☐ Camel ☐ Skoal Wintergreen
☐ Marlboro Golds ☐ Camel Blues
☐ VUSE refill (specify flavor): _____
☐ Blu disposable (specify flavor): _____
☐ Other brand (please specify): _____

Did the clerk ask for youth's ID?

- ☐ Yes ☐ No

Did the clerk ask for youth's age?

- ☐ Yes ☐ No

Notes:

Youth Inspector Initial: _____

Adult Inspector Signature: _____

Return the completed form to:

Wyoming Survey & Analysis Center, Dept. 3925
1000 E. University Ave., Laramie, WY 82071