Taxation of Emerging Tobacco Products: 2022 Update

Frank J. Chaloupka
Distinguished Professor Emeritus
University of Illinois at Chicago
fjc@uic.edu

John A. Tauras
Associate Professor
University of Illinois at Chicago

December 2022

2020 Report Commissioned by the American Heart Association; 2022 Update Commissioned by the American Cancer Society Cancer Action Network, Inc.

Introduction

Significant increases in tobacco excise taxes are widely considered the single most effective policy for reducing tobacco use and its consequences.[1] In recent years, as new tobacco products, particularly e-cigarettes, have emerged and grown in popularity, governments have struggled to determine how best to tax these products. Proposals that would apply differential taxation based on the relative harms of different products have added to the complexity.[2] This is further complicated by the rapid evolution of these products and limited, at best, regulation of these products.

This report begins with an assessment of current tobacco and e-cigarette taxes in the United States. This is followed by a discussion of the challenges that states have encountered in implementing taxes on electronic cigarettes. Based on these experiences, we propose a set of recommendations on how to best tax these products

Current Tax Structures for Tobacco Products

In the United States (US), tobacco products are taxed by federal, state, and local governments. Two types of excise taxes are applied to tobacco products in the US – specific and *ad valorem*. A specific excise tax is a constant nominal rate per unit of quantity. For example, a specific excise tax might take the form of a fixed amount per pack of cigarettes, a fixed amount per weight of tobacco, or a fixed amount per ounce of liquid nicotine. An *ad valorem* tax is a tax based on the value of a tobacco product. For example, an *ad valorem* tax might take the form of percentage of the manufacture, wholesale, or retail price of a tobacco product.

Federal Taxes

The current federal tax rate on cigarette is $1.0066 per pack of 20 cigarettes. The last federal tax change on cigarettes occurred on April 1, 2009 when the tax increased from $0.39 per pack to $1.0066 per pack. At the same time, Congress equalized the tax rate on small cigars that look like cigarettes and on roll-your-own cigarettes to that of conventional cigarettes. The federal tax on large cigars is 52.75% of the manufacturer's price of the cigar, with a maximum tax of $0.4026 per cigar. The federal tax on loose moist snuff, snus, and dissolvable tobacco products is $1.51 per pound and for chewing tobacco is $0.503 per pound. Finally, pipe tobacco is currently being taxed at $2.8311 per pound at the federal level.

At this time, the federal government does not tax electronic cigarettes, while taxing heated tobacco products at a rate equivalent to the federal tax on cigarettes. However,

[1] U.S. National Cancer Institute and World Health Organization (2016). *The Economics of Tobacco and Tobacco Control*. National Cancer Institute Tobacco Control Monograph 21. NIH Publication No. 16-CA-8029A. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute; and Geneva, CH: World Health Organization.

[2] Chaloupka FJ, Sweanor D, Warner KE (2015). Differential Taxes for Differential Risks – Toward Reduced Harm from Nicotine-Yielding Products. *New England Journal of Medicine* 373:594-597.

this may change if the Tobacco Tax Equity Act of 2021 is adopted. This act aims to establish taxes equivalent to the federal cigarette tax on all tobacco products, including e-cigarettes. This is not the first time a federal tax on e-cigarettes has been introduced in the US Congress. In 2019, Senator Ron Wyden (Oregon) and 18 colleagues introduced legislation to tax electronic cigarettes and other “alternative nicotine products.” This proposal, known as the E-cigarette Tax Parity Act, would have expanded the definition of taxable tobacco products under the Tax Code to include e-cigarettes and other “alternative nicotine products” and taxed them at a rate equal to the federal cigarette tax. Around the same time, Representatives Tom Suozzi and Peter King of New York introduced a bill to tax the nicotine used in e-cigarettes at a rate equivalent to the cigarette tax rate or, if greater, at a rate of $50.33 per 1,810 milligrams of nicotine, the same rate in the more recent proposal.

State and Local Taxes

Cigarettes

All 50 states and the District of Columbia (DC) currently impose a specific excise tax on cigarettes. As can be seen in Table 1, state excise tax rates range from a low of 17 cents per pack in Missouri to $4.50 per pack in DC. Since 2002, 48 states and the DC have increased their cigarette tax rates over 140 times.

Table 1

State Specific Excise Tax Rates as of July 1, 2022

State	Tax per Pack	State	Tax per Pack
Alabama	$0.68	Montana	$1.70
Alaska	$2.00	Nebraska	$0.64
Arizona	$2.00	Nevada	$1.80
Arkansas	$1.15	New Hampshire	$1.78
California	$2.87	New Jersey	$2.70
Colorado	$1.94	New Mexico	$2.00
Connecticut	$4.35	New York	$4.35
Delaware	$2.10	North Carolina	$0.45
DC	$4.50	North Dakota	$0.44
Florida	$1.34	Ohio	$1.60
Georgia	$0.37	Oklahoma	$2.03
Hawaii	$3.20	Oregon	$3.33
Idaho	$0.57	Pennsylvania	$2.60
Illinois	$2.98	Rhode Island	$4.25
Indiana	$1.00	South Carolina	$0.57
Iowa	$1.36	South Dakota	$1.53
Kansas	$1.29	Tennessee	$0.62

State	Tax per Pack	State	Tax per Pack
Kentucky	$1.10	Texas	$1.41
Louisiana	$1.08	Utah	$1.70
Maine	$2.00	Vermont	$3.08
Maryland	$3.75	Virginia	$0.60
Massachusetts	$3.51	Washington	$3.03
Michigan	$2.00	West Virginia	$1.20
Minnesota	$3.04	Wisconsin	$2.52
Mississippi	$0.68	Wyoming	$0.60
Missouri	$0.17		

Source: Campaign for Tobacco-Free Kids, 2022.

In addition, more than 630 cities, towns, and counties in the US impose their own specific excise taxes on cigarettes. Compared to state tax rates, most of these local jurisdictions apply a relatively smaller tax. However, several cities and counties do impose large cigarette taxes. For example, Glenwood Springs, CO, Carbondale, CO, Eagle County, CO and Summit County, CO impose a $4.00 per pack tax; Aspen CO, New Castle CO, and Pitkin County CO impose a $3.20 per pack tax; Cook County, IL, Avon, CO, Juneau, AK, Crested Butte, CO, and Vail, CO impose a $3.00 per pack tax; Sitka, Anchorage, Matanuska-Susitna Borough, Bethel, Kotzebue, Petersburg, Ketchikan, and Northwest Arctic Alaska impose taxes of $2.462, $2.41, $2.28, $2.21, $2.20, $2.03, $2.00, and $2.00, per pack, respectively. Similarly, Basalt, CO imposes a tax of $2 per pack. Moreover, several other large cities like Philadelphia and New York City have large taxes on cigarettes at $2.00 and $1.50 per pack, respectively. Combining federal, state, and local level taxes, individuals purchasing cigarettes in Chicago pay the highest cigarette excise taxes in the country at $8.17 per pack.

Other Tobacco Products

Every state and DC taxes snuff, chewing tobacco, cigars, and other smoking tobacco, with the exceptions of Florida (which does not tax any cigars) and Pennsylvania (which does not tax large cigars), but do tax the other aforementioned tobacco products.

Snuff

All 50 states and DC tax snuff. Some states tax snuff on an *ad valorem* basis and some tax snuff on a specific tax basis. Table 2 lists the states that tax snuff on an *ad valorem* basis and provides the rate at which snuff is taxed. Table 3 lists the states that tax snuff on a specific tax basis and provides the rate at which it is taxed. As can be seen in Tables 2 and 3, more than half the states and DC apply an *ad valorem* tax towards snuff. The *ad valorem* tax rates range from 5% of manufacture price in South Carolina to 210% of wholesale price in Massachusetts. The remaining 23 states tax snuff on a specific tax basis. The specific tax ranges from 1 to 12 cents per ounce (based on weight) in Alabama to $3.00 per ounce in Connecticut.

Table 2

Snuff – *Ad Valorem* Tax as of July 1, 2022

1	Alaska	75% of Wholesale price
2	Arkansas	68% of Manufacture price
3	California	63.49% of Wholesale price
4	Colorado	50% of Manufacture price ($1.48 min tax)
5	DC	91% of Wholesale price
6	Florida	85% of Wholesale price
7	Georgia	10% of Wholesale price
8	Hawaii	70% of Wholesale price
9	Idaho	40% of Wholesale price
10	Kansas	10% of Wholesale price
11	Louisiana	20% of Manufacture price
12	Maryland	53% of Wholesale price
13	Massachusetts	210% of Wholesale price
14	Michigan	32% of Wholesale price
15	Minnesota	95% of Wholesale price ($3.04 min tax)
16	Mississippi	15% of Manufacture price
17	Missouri	10% of Manufacture price
18	Nevada	30% of Wholesale price
19	New Hampshire	65.03% of Wholesale price
20	New Mexico	25% of Manufacture price
21	North Carolina	12.8% of Wholesale price
22	Ohio	17% of Wholesale price
23	Oklahoma	60% of Manufacture price
24	South Carolina	5% of Manufacture price
25	South Dakota	35% of Wholesale price
26	Tennessee	6.6% of Wholesale price
27	West Virginia	12% of Wholesale price
28	Wisconsin	100% of Manufacture price

Source: Campaign for Tobacco-Free Kids, 2022.

Table 3

Snuff – Specific Tax as of July 1, 2022

1	Alabama	1 to 12 Cents Per Ounce (based on weight)
2	Arizona	22.25 Cents Per Ounce
3	Connecticut	300 Cents Per Ounce
4	Delaware	92 Cents Per Ounce
5	Illinois	30 Cents Per Ounce
6	Indiana	40 Cents Per Ounce
7	Iowa	119 Cents Per Ounce
8	Kentucky	19 Cents Per Unit
9	Maine	202 Cents Per Ounce

10	Montana	85 Cents Per Ounce
11	Nebraska	44 Cents Per Ounce
12	New Jersey	75 Cents Per Ounce
13	New York	200 Cents Per Ounce
14	North Dakota	60 Cents Per Ounce
15	Oregon	178 Cents Per Ounce
16	Pennsylvania	55 Cents Per Ounce
17	Rhode Island	100 Cents Per Ounce
18	Texas	122 Cents Per Ounce
19	Utah	183 Cents Per Ounce
20	Vermont	257 Cents Per Ounce or 308 per pack if less than 1.2 ounces
21	Virginia	36 Cents Per Ounce
22	Washington	252.6 Cents Per 1.2 Ounce min.
23	Wyoming	60 Cents Per Ounce

Source: Campaign for Tobacco-Free Kids, 2022.

Cigars

48 states and DC tax cigars (Florida does not impose an excise tax on any cigars and Pennsylvania does not tax large cigars). Some states tax cigars on an *ad valorem* basis and some tax cigars on a specific tax basis. Table 4 lists the states that tax cigars on an *ad valorem* basis and provides the rate at which cigars are taxed. Table 5 lists the states that tax cigars on a specific tax basis and provides the rate at which they are taxed. As can be seen in Tables 4 and 5, only 6 states apply a specific tax on cigars. The specific tax ranges from .01 cents per cigar in Texas (for cigars that weigh less than 3 pounds per thousand) to $4.00 per cigar in Vermont (if wholesale price of the cigar is greater than or equal to $10.00). 44 states and DC impose an *ad valorem* tax on cigars. The tax ranges from 5% of manufacturer price in South Carolina to 95% of wholesale price in Washington and Minnesota. One state, Vermont, imposes both an *ad valorem* tax and a specific tax. If the wholesale price of a cigar is less than or equal to $2.17, the tax is 92% of wholesale price in Vermont; if the wholesale price is greater than $2.17 but less than $10.00 a specific excise tax of $2.00 per cigar is imposed; if the wholesale price is $10.00 or more a specific excise tax of $4.00 per cigar is imposed. Finally, 17 states and DC tax little cigars at the same rate as cigarettes. These states include: CT, HI, IL, IA, MA, MN, MT, NH, NM, NY, OK, PA, RI, TN, UT, VT, AND WA.

Table 4

Cigars – *Ad Valorem* Tax as of July 1, 2022

1	Alaska	75% of Wholesale price
2	Arkansas	68% of Manufacture price
3	California	63.49% of Wholesale price
4	Colorado	50% of Manufacture price
5	Connecticut	50% of Wholesale price
6	Delaware	30% of Wholesale price

7	DC	91% of Wholesale price (cigars<$2 only)
8	Georgia	23% of Wholesale price
9	Hawaii	50% of Wholesale price
10	Idaho	40% of Wholesale price
11	Illinois	36% of Wholesale price
12	Indiana	24% of Wholesale price
13	Iowa	50% of Wholesale price ($0.50 cap)
14	Kansas	10% of Wholesale price
15	Kentucky	15% of Wholesale price
16	Louisiana	8% - 20% of Manufacture price
17	Maine	43% of Wholesale price
18	Maryland	70% (non-premium) 15% (premium) of Wholesale price
19	Massachusetts	40% of Wholesale price
20	Michigan	32% of Wholesale price
21	Minnesota	95% of Wholesale price ($0.50 cap premium)
22	Mississippi	15% of Manufacture price
23	Missouri	10% of Manufacture price
24	Montana	50% of Wholesale price
25	Nebraska	20% of Wholesale price
26	Nevada	30% of Wholesale price
27	New Hampshire	65.03% of Wholesale price
28	New Jersey	30% of Wholesale price
29	New Mexico	25% of Manufacture price ($0.50 cap)
30	New York	75% of Wholesale price
31	North Carolina	12.8% of Wholesale price
32	North Dakota	28% of Wholesale price
33	Ohio	Large cigars 37% other cigars 17% of Wholesale price
34	Oregon	65% of Wholesale price ($1.00 cap)
35	Rhode Island	80% of Wholesale price (50 cent cap)
36	South Carolina	5% of Manufacture price
37	South Dakota	35% of Wholesale price
38	Tennessee	6.6% of Wholesale price
39	Utah	86% of Manufacture price
40	Vermont	92% of Wholesale price if wholesale price is less than or equal to $2.17
41	Virginia	20% of Manufacture price
42	Washington	95% of Taxable Sales Price ($0.75 cap)
43	West Virginia	12% of Wholesale price
44	Wisconsin	71% of Manufacture price ($0.50 cap)
45	Wyoming	20% of Wholesale price

Source: Campaign for Tobacco-Free Kids, 2022.

Table 5

Cigars – Specific Tax as of July 1, 2022

1	Alabama	4 to 40.5 Cents Per 10 cigars (based on number of cigars received)
2	Arizona	22.05 - 218 Cents Per 10 cigars
3	Oklahoma	3.6 – 120 Cents Per 10 cigars
4	Texas	1-15 Cents Per 10 Cigars
5	Vermont	200 Cents Per Cigar if Wholesale Price is greater than $2.17 but less than $10; 400 Cents Per Cigar if Wholesale Price is greater than or equal to $10;

Source: Campaign for Tobacco-Free Kids, 2022.

Chewing Tobacco

All 50 states and DC tax chewing tobacco. Most tax chewing tobacco on an *ad valorem* basis and some tax chewing tobacco on a specific tax basis. Table 6 lists the states that tax chewing tobacco on an *ad valorem* basis and provides the rates at which chewing tobacco is taxed. Table 7 lists the states that tax chewing tobacco on a specific tax basis and provides the rate at which they are taxed. As can be seen in Tables 6 and 7, only 7 states apply a specific tax towards chewing tobacco. The specific tax ranges from 1.5 cents per ounce in Alabama to $2.02 per ounce in Maine. 43 states and DC impose an *ad valorem* tax on chewing tobacco. The *ad valorem* tax ranges from 5% of manufacture price in South Carolina to 210% of wholesale price in Massachusetts.

Table 6

Chewing Tobacco – *Ad Valorem* Tax as of July 1, 2022

1	Alaska	75% of Wholesale price
2	Arkansas	68% of Manufacture price
3	California	63.49% of Wholesale price
4	Colorado	50% of Manufacture price
5	Connecticut	50% of Wholesale price
6	Delaware	30% of Wholesale price
7	DC	91% of Wholesale price
8	Florida	85% of Wholesale price
9	Georgia	10% of Wholesale price
10	Hawaii	70% of Wholesale price
11	Idaho	40% of Wholesale price
12	Illinois	36% of Wholesale price
13	Indiana	24% of Wholesale price
14	Iowa	50% of Wholesale price
15	Kansas	10% of Wholesale price
16	Kentucky	15% of Wholesale price
17	Louisiana	20% of Manufacture price
18	Maryland	53% Wholesale price

19	Massachusetts	210% of Wholesale price
20	Michigan	32% of Wholesale price
21	Minnesota	95% of Wholesale price
22	Mississippi	15% of Manufacture price
23	Missouri	10% of Manufacture price
24	Montana	50% of Wholesale price
25	Nebraska	20% of Wholesale price
26	Nevada	30% of Wholesale price
27	New Hampshire	65.03% of Wholesale price
28	New Jersey	30% of Wholesale price
29	New Mexico	25% of Manufacture price
30	New York	75% of Wholesale price
31	North Carolina	12.8% of Wholesale price
32	Ohio	17% of Wholesale price
33	Oklahoma	60% of Manufacture price
34	Oregon	65% of Wholesale price
35	Rhode Island	80% of Wholesale price
36	South Carolina	5% of Manufacture price
37	South Dakota	35% of Wholesale price
38	Tennessee	6.6% of Wholesale price
39	Utah	86% of Manufacture price
40	Vermont	92% of Wholesale price
41	Washington	95% of Taxable Sales Price
42	West Virginia	12% of Wholesale price
43	Wisconsin	71% of Manufacture price
44	Wyoming	20% of Wholesale price

Source: Campaign for Tobacco-Free Kids, 2022.

Table 7

Chewing Tobacco – Specific Tax as of July 1, 2022

1	Alabama	1.5 Cents Per Ounce
2	Arizona	5.45 - 22.25 Cents Per Ounce
3	Maine	202 Cents Per Ounce
4	North Dakota	16 Cents Per Ounce
5	Pennsylvania	55 Cents Per Ounce
6	Texas	122 Cents Per Ounce
7	Virginia	42 – 140 Cents Per Unit (based on weight)

Source: Campaign for Tobacco-Free Kids, 2022.

Other Smoking Tobacco

All 50 states tax other smoking tobacco. Most states tax other smoking tobacco on an *ad valorem* basis and a few tax other smoking tobacco on a specific tax basis. Table 8 lists the states that tax other smoking tobacco on an *ad valorem* basis and provides the rate at which other smoking tobacco is taxed. Table 9 lists the states that tax other smoking tobacco on a specific tax basis and provides the rate at which it is taxed. As can be seen in Tables 8 and 9, only 4 states apply a specific tax towards other smoking tobacco. The specific tax ranges from a low of 4 cents per ounce in Alabama to $1.22 per ounce in Texas. 46 states and DC impose an *ad valorem* tax on other smoked tobacco. The *ad valorem* tax ranges from 5% of manufacturer price in South Carolina to 95% of wholesale price in Washington and Minnesota.

Table 8

Other Smoking Tobacco – *Ad Valorem* Tax as of July 1, 2022

1	Alaska	75% of Wholesale price
2	Arkansas	68% of Manufacture price
3	California	63.49% of Wholesale price
4	Colorado	50% of Manufacture price
5	Connecticut	50% of Wholesale price
6	Delaware	30% of Wholesale price
7	DC	91% of Wholesale price
8	Florida	85% of Wholesale price
9	Georgia	10% of Wholesale price
10	Hawaii	70% of Wholesale price
11	Idaho	40% of Wholesale price
12	Illinois	36% of Wholesale price
13	Indiana	24% of Wholesale price
14	Iowa	50% of Wholesale price
15	Kansas	10% of Wholesale price
16	Kentucky	15% of Wholesale price
17	Louisiana	33% of Manufacture price
18	Maine	43% of Wholesale price
19	Maryland	30% Wholesale price
20	Massachusetts	40% of Wholesale price
21	Michigan	32% of Wholesale price
22	Minnesota	95% of Wholesale price
23	Mississippi	15% of Manufacture price
24	Missouri	10% of Manufacture price
25	Montana	50% of Wholesale price
26	Nebraska	20% of Wholesale price
27	Nevada	30% of Wholesale price
28	New Hampshire	65.03% of Wholesale price
29	New Jersey	30% of Wholesale price
30	New Mexico	25% of Manufacture price
31	New York	75% of Wholesale price
32	North Carolina	12.8% of Wholesale price
33	North Dakota	28% of Wholesale price
34	Ohio	17% of Wholesale price
35	Oklahoma	80% of Manufacture price
36	Oregon	65% of Wholesale price
37	Rhode Island	80% of Wholesale price
38	South Carolina	5% of Manufacture price
39	South Dakota	35% of Wholesale price

40	Tennessee	6.6% of Wholesale price
41	Utah	86% of Manufacture price
42	Vermont	92% of Wholesale price
43	Virginia	10% of Manufacture price
44	Washington	95% of Taxable Sales Price
45	West Virginia	12% of Wholesale price
46	Wisconsin	71% of Manufacture price
47	Wyoming	20% of Wholesale price

Source: Campaign for Tobacco-Free Kids, 2022.

Table 9

Other Smoking Tobacco – Specific Tax as of July 1, 2022

1	Alabama	4-6 Cents Per Ounce
2	Arizona	5.45 - 22.25 Cents Per Ounce
3	Pennsylvania	55 Cents Per Ounce
4	Texas	122 Cents Per Ounce

Source: Campaign for Tobacco-Free Kids, 2022.

Snus

46 states tax snus. Alabama, Connecticut, New Hampshire, and North Dakota are the only states not to tax snus. Most states tax snus on an *ad valorem* basis and some tax snus on a specific tax basis. Table 10 lists the states that tax snus on an *ad valorem* basis and provides the rate at which snus is taxed. Table 11 lists the states that tax snus on a specific tax basis and provides the rate at which it is taxed. As can be seen in Tables 10 and 11, only 6 states apply a specific tax on snus. The specific tax ranges from a low of 12.66 cents per ounce in Kentucky to $2.57 per ounce in Vermont. The average specific tax across these six states is $1.118 per ounce. 40 states and DC impose an *ad valorem* tax on snus. The *ad valorem* tax ranges from 5% of manufacturer price in South Carolina to 95% of wholesale price in Minnesota and Washington.

Table 10

Snus – *Ad Valorem* Tax as of July 1, 2022

1	Alaska	75% of Wholesale price
2	Arkansas	68% of Manufacture price
3	California	63.49% of Wholesale price
4	Colorado	50% of Manufacture price
5	Delaware	30% of Wholesale price
6	DC	91% of Wholesale price
7	Florida	85% of Wholesale price
8	Georgia	10% of Wholesale price
9	Hawaii	70% of Wholesale price
10	Idaho	40% of Wholesale price
11	Illinois	36% of Wholesale price
12	Indiana	24% of Wholesale price

13	Iowa	50% of Wholesale price
14	Kansas	10% of Wholesale price
15	Louisiana	20% of Manufacture price
16	Maryland	53% Wholesale price
17	Massachusetts	40% of Wholesale price
18	Michigan	32% of Wholesale price
19	Minnesota	95% of Wholesale price
20	Mississippi	15% of Manufacture price
21	Missouri	10% of Manufacture price
22	Montana	50% of Wholesale price
23	Nebraska	20% of Wholesale price
24	Nevada	30% of Wholesale price
25	New Jersey	30% of Wholesale price
26	New Mexico	25% of Manufacture price
27	New York	75% of Wholesale price
28	North Carolina	12.8% of Wholesale price
29	Ohio	17% of Wholesale price
30	Oklahoma	60% of Manufacture price
31	Oregon	65% of Wholesale price
32	Rhode Island	80% of Wholesale price
33	South Carolina	5% of Manufacture price
34	South Dakota	35% of Wholesale price
35	Tennessee	6.6% of Wholesale price
36	Utah	86% of Manufacture price
37	Virginia	10% of Wholesale price
38	Washington	95% of Taxable Sales Price
39	West Virginia	12% of Wholesale price
40	Wisconsin	71% of Manufacture price
41	Wyoming	20% of Wholesale price

Source: State Tobacco Activities Tracking and Evaluation System, 2022.

Table 11

Snus – Specific Tax as of July 1, 2022

1	Arizona	22.25 Cents Per Ounce
2	Kentucky	12.66 Cents per Ounce
3	Maine	202 Cents Per Ounce
4	Pennsylvania	55 Cents Per Ounce
5	Texas	122 Cents Per Ounce
6	Vermont	257 Cents Per Ounce

Source: State Tobacco Activities Tracking and Evaluation System 2022.

E-cigarettes

Currently 30 states and the District of Columbia tax electronic cigarettes. Some states tax e-cigarettes on an *ad valorem* basis, some tax them on a specific tax basis, and some states such as Connecticut, Georgia, Kentucky, New Hampshire, New Jersey, and New Mexico apply a two-tier tax that employs both *ad valorem* and specific excise taxes. The e-cigarette taxing strategies of states are quite different. States are currently taxing one or more of the following e-cigarette products: e-cigarette devices; e-cigarette kits, components of e-cigarette devices, volume of the consumable liquid product that contains nicotine, and volume of the consumable liquid product that is not required to contain nicotine. Table 12 lists the states that tax e-cigarettes on an *ad valorem* basis, provides the initial effective date and tax rate as well as the dates of all subsequent tax changes and tax rates, and provides a description of what each state is taxing. Table 13 lists the states that tax e-cigarettes on a specific basis, provides the initial effective date and tax rate as well as the dates of all subsequent tax changes and tax rates, and provides a description of exactly what each state is taxing. As can be seen in Tables 10 and 11, 15 states and DC apply an *ad valorem* tax on e-cigarettes, 9 states apply a specific tax, and 6 states apply both an *ad valorem* and a specific tax.

States that apply only an *ad valorem* tax differ in what constitutes a taxable e-cigarette. In California, Colorado, DC, Maine, Massachusetts, Minnesota, and Wyoming the e-cigarette device, some components, and consumable liquid must contain nicotine to be taxed. In nine states (IL, IN, MD, NV, NY, OR, PA, UT, and VT) the e-cigarette device, some components, and consumable liquid do not need to contain nicotine to be taxed. Among the states and DC that only apply an *ad valorem* tax, the tax ranges from 12% of retail price for open system products in Maryland to 95% of wholesale price in Minnesota.

All states that apply only a specific tax to e-cigarettes tax the number of milliliters of consumable product (i.e. ml of liquid) purchased, nothing else. States, however, differ on what constitutes a consumable product to be taxed. Five states (DE, LA, NC, OH, and VA) require the consumable product to contain nicotine, whereas, four states (KS, WA, WV, and WI) do not require the consumable product to contain nicotine. Washington state is a unique case that applies a two-tier specific tax where consumable product in closed systems with less than 5 ml of consumable product are taxed at 27 cents per ml, whereas, open container consumable product is taxed at 9 cents per ml. Excluding Washington state, among the states that only apply a specific tax, the tax ranges from 5 cents per ml to 10 cents per ml.

Finally, six states, Connecticut, Georgia, Kentucky, New Hampshire, New Jersey, and New Mexico, impose a two-tier mixed tax on e-cigarettes. In Connecticut an *ad valorem* tax of 10% of wholesale price is applied to open e-cigarette devices and bottled e-juice that contain nicotine and a specific tax of 40 cents per ml of e-liquid in closed products (i.e. pods and cigalikes) is applied. In Georgia, an *ad valorem* tax of 7% of wholesale price is applied to open e-cigarette devices and disposables and a specific tax of 5 cents per ml of consumable e-cigarettes used in closed products is applied. In Kentucky, an *ad valorem* tax of 15% of wholesale price is applied to open e-cigarette devices and bottled e-liquid and a specific tax of $1.50 per cartridge on closed e-cigarettes is applied. In New Hampshire, the tax is 8% of wholesale price on liquids used in open systems and 30 cents per ml on solutions used in closed systems. In New Jersey, an *ad valorem* tax of 10% of listed retail price is applied to containers of e-liquid to be used in open systems and a specific tax of 10 cents per fluid ml is applied to liquid nicotine in pre-filled cartridges. In New Mexico, an *ad valorem* tax of 12.5% of the price is applied to liquid intended to be used in an open system e-cigarette device and a specific tax of 50 cents per closed system single-use, pre-filled disposable cartridges containing five milliliters or less of e-liquid is imposed.

Table 12

E-cigarette Taxes – Effective Dates, *Ad Valorem* Rate, and Products that are Taxed

California	4/1/2017 7/1/2017 7/1/2018 7/1/2019 7/1/2020 7/1/2021	27.3% of Wholesale price 65.08% of Wholesale price 62.78% of Wholesale price 59.27% of Wholesale price 56.93% of Wholesale price 63.49% of Wholesale price	E- cigarette device, component sold separately, liquid or substance containing nicotine used in an e-cigarette.
Colorado	1/1/2021 1/1/2022 1/1/2023 7/1/2024 7/1/2027	30% of Manufacturer price 35% of Manufacturer price 50% of Manufacturer price 56% of Manufacturer price 62% of Manufacturer price	All nicotine products, excluding cigarettes, tobacco products, authorized USDHHS products, and modified risk tobacco products are subject to the tax.
Connecticut	10/1/2019	10% of Wholesale price	Two-Tiered Tax: Ad Valorem is applied to open electronic nicotine delivery systems, liquid nicotine containers, vapor products, and electronic cigarette liquids (must contain nicotine). Ad valorem does not apply to closed devices that prefilled and sealed by manufacturer and not intended to be refillable – these have a specific tax
DC	10/1/2015 10/1/2016 10/1/2017 10/1/2018 10/1/2019	67% of Wholesale price 65% of Wholesale price 60% of Wholesale price 96% of Wholesale price 91% of Wholesale price	All vapor products including vapor devices, vapor cartridges or other containers of nicotine in a solution or other form and when purchased separately all component parts of the device.
Georgia	1/1/2021	7% of Wholesale price	Two-Tiered Tax: Ad Valorem is applied to vapor devices that contain any consumable vapor

			product at the time of sale and which are not designed or intended to be reused or refilled and to consumable vapor products in an open system Ad valorem does not apply to closed devices – these have a specific tax
Illinois	07/1/2019	15% of Wholesale price	E-cigarette device, cartridge, e-cigarette specific components, and solution or substance used in e-cigarettes (does not need nicotine to be taxed)
Indiana	7/1/2022	25% of Wholesale price 15% of retail price	Closed system cartridges taxed at rate of 25% of the wholesale price Open system consumable material and vapor products taxed at rate of 15% of gross retail price
Kentucky	8/1/2020	15% of Wholesale price	Two-Tiered Tax: Ad Valorem is applied to open vaping systems and liquid solution. Ad valorem does not apply to closed devices – these have a specific tax
Maine	1/2/2020	43% of Wholesale price	Electronic smoking device, components, and liquid used in electronic smoking devices
Maryland	3/14/2021	12% or 60% Retail price	Vaping liquid in containers with capacity ≤5ml (i.e cartridges, pods, disposables: 60% retail price; others open system products including electronic smoking devices, components, and any substance used in an electronic smoking device: 12% retail price.
Massachusetts	6/1/2020	75% of Wholesale price	Electronic nicotine delivery systems, components, and

			noncombustible liquid or gels used in electronic nicotine delivery systems
Minnesota	8/1/2010 7/1/2013	70% of Wholesale Price 95% of Wholesale price	Electronic delivery devices, nicotine solution products, and component parts of electronic delivery devices.
Nevada	7/1/2019	30% of Wholesale price	Vapor products, components of vapor products, and vapor cartridges or other container of solution. (does not need nicotine to be taxed)
New Hampshire	1/1/2020	8% of Wholesale price	Two-Tiered Tax: Ad Valorem is applied to containers of liquid or other substances containing nicotine that are intended to be opened and used in e-cigarettes. Ad valorem does not apply to closed cartridges or containers – these have a specific tax
New Jersey	11/1/ 2019	10% of the listed retail price	Two-tiered tax: Ad Valorem is applied to containers of e-liquid (used in an open system) e- liquid that does not contain nicotine is not subject to tax. Specific tax is applied to pre-filled cartridges
New Mexico	7/1/2019	12.5% of Product Value	Two-Tiered Tax: e-liquid intended to be used in an open system e-cigarette device (does not require nicotine); cannabis liquid/oil not taxed
New York	12/1/2019	20% supplemental sales tax based on retail price	All vapor products defined as any noncombustible liquid or gel, regardless of the presence of nicotine therein, that is manufactured into a finished product for use in an electronic cigarette, including any device that

			contains such noncombustible liquid or gel
Oregon	1/1/2021	65% of Wholesale price	On all inhalant delivery system products including: E-cigarettes (reusable and disposable), vape products/devices, components of vape devices, Liquid or e-juice, regardless of whether or not it contains nicotine. Not taxed: battery chargers and lanyards if sold separately, any product that has been approved by the FDA for sale as a tobacco cessation product or for any other therapeutic purpose, and marijuana items.
Pennsylvania	10/1/2016	40% of Wholesale price	E-cigarette devices, e-cig kits, any liquid or substance placed in or sold for use in an electronic cigarette (nicotine not required) not taxed: coils, reservoirs, batteries
Utah	7/1/2020	56% of Manufacturer price	e-cigarette substances or prefilled electronic cigarettes
Vermont	7/1/2019	92% of Wholesale price	All tobacco substitutes including delivery devices such as e-cigarettes and any liquids to be used in these devices, whether nicotine based or not. Repair parts, accessories, and charging devices that can only be used in vaping devices or are custom made for vaping devices are taxable.
Wyoming	7/1/2020	15% of Wholesale price	Any device that can be used to deliver aerosolized or vaporized

			nicotine or synthetic nicotine. This includes vapor material intended to be aerosolized or vaporized and all components, of the device It does not include a battery or battery charger if sold separately and does not include any product regulated by the FDA under subchapter V of the Food, Drug and Cosmetic Act.

Source: Campaign for Tobacco-Free Kids, 2022; Public Health Law Center, 2021.

Table 13

E-cigarette Taxes – Effective Dates, Specific Tax Rate, and Products that are Taxed

Connecticut	10/1/2019	40 cents per ml	Two-Tiered Tax: closed e-cigarette products that are prefilled and sealed by manufacturer and not intended to be refillable have a specific tax
Delaware	1/1/2018	5 cents per ml	any nicotine liquid solution or other material containing nicotine that is intended to be used with or in an electronic smoking device.
Georgia	1/1/2021	5 cents per ml	Two-Tiered Tax: Consumable vapor products for use in a closed system
Kansas	1/1/2017 7/1/2017	20 cents per ml 5 cents per ml	Consumable material required nicotine prior to 7/1/17. After 7/1/17 no nicotine required to be taxed consumable material. Consumable material is defined as any liquid solution or other material that is depleted as an electronic cigarette is used
Kentucky	8/1/2020	$1.50 per cartridge	Two-Tiered Tax: Tax on closed vapor cartridges is $1.50 per cartridge
Louisiana	8/1/2015	5 cents per ml	Vapor products and electronic cigarettes taxed at $0.05 per milliliter of consumable nicotine liquid

			solution or other material containing nicotine that is depleted as a vapor product is used.
New Hampshire	1/1/2020	30 cents per ml	For closed cartridges or containers of liquid or other substances containing nicotine that are not intended to be opened
New Jersey	9/29/2018 11/1/2019	10 cents per ml 10 cents per ml	Two Tier Mixed tax 10 cents per fluid milliliter on liquid nicotine in a pre-filled cartridge or other container where the cartridge or container is marketed, sold, or intended for use as part of an electronic smoking device
New Mexico	7/1/2019	50 cents per closed system cartridges (1-time use)	Two-Tiered Tax: A closed system single-use, pre-filled disposable cartridge containing five milliliters or less of e-liquid
North Carolina	6/1/2015	5 cents per ml	Consumable product that must contain nicotine. Consumable product is defined as any nicotine liquid solution or other material containing nicotine that is depleted as a vapor product is used
Ohio	10/1/2019	10 Cents per ml 10 Cents per gram	Vapor products taxed at rate of $0.01 per vapor volume. Vapor volume means one of the following, as applicable: (1) if a vapor product is sold in liquid form, one-tenth of one milliliter of vapor product; (2) if the vapor product is sold in nonliquid form, one-tenth of one gram of vapor product.
Virginia	7/1/2020	6.6 Cents per ml	Liquid nicotine is subject to Virginia's tobacco products tax at a rate of 6.6¢ per milliliter. Liquid nicotine is defined as a liquid or other substance containing nicotine in any concentration that is sold, marketed, or

			intended for use in a nicotine vapor product
Washington	10/1/2019	9 cents per ml (open container) 27 cents per ml (closed)	Two Tier Specific Tax: 1) Open container solution: Any accessible container of solution, regardless of whether it contains nicotine, that is greater than five milliliters (mL), is taxed at 9-cents per ml. 2) Closed Pods/cartridges less than 5 ml taxed at 27 cents per ml
West Virginia	7/1/2016	7.5 cents p er ml	E-cigarette liquid is taxed. Does not need to contain nicotine
Wisconsin	10/1/2019	5 cents per ml	Vapor products taxed at rate of $0.05 per ml of liquid or other substance. liquid or other substance does not require nicotine to be taxed.

Source: Campaign for Tobacco-Free Kids, 2022; Public Health Law Center, 2021.

In addition, several cities, towns, and counties in the US impose their own excise taxes on electronic cigarettes. For example: Aspen Colorado imposes an *ad valorem* 40% tax of wholesale price; Chicago, IL imposes a tax of $1.50 per product unit AND $1.20 per fluid ml of consumable product; Cook County IL imposes a tax of $0.20 per ml of consumable product; Juneau, NW Arctic, and Petersburg Alaska impose an *ad valorem* tax of 45% of wholesale price; Matanuska-Susitna Borough Alaska and Anchorage Borough impose a tax of 55% of wholesale price; Omaha, NE taxes e-cigarettes at 3% as part of the tobacco tax, and Montgomery County Maryland imposes a tax of 30% of wholesale price.

Heated Tobacco Products

In May 2019, the Food and Drug Administration (FDA) issued a marketing order for the sale of IQOS, a heated tobacco product, in the United States, where Altria has the rights to sell the product through an agreement with Philip Morris International. Altria opened the first official IQOS store in the U.S. on October 4, 2019 in Atlanta, approximately five months after the FDA permitted the sale of IQOS.. A second and third store opened in Richmond, VA and Charlotte, NC in November 2019, and July 2020, respectively. Altria's USA expansion strategy was halted on September 29, 2021, when the United States International Trade Commission ruled that Philip Morris International and Altria must stop the sale and import of IQOS in the United States (pending a 60-day review by the Biden Administration) because IQOS infringed on two patents held by RJ Reynolds. On November 29, 2021 the Biden Administration confirmed that it would not take any action regarding the patent infringement litigation and Altria has stopped selling and importing IQOS in the United States now that the ban has gone into effect.

The FDA has categorized IQOS and the HeatSticks (compressed tobacco and other chemicals that go into an IQOS device) as noncombustible cigarettes. HeatSticks are categorized as cigarettes under the current definition of cigarettes in the federal tax code, and therefore are subject to the same federal excise tax as combustible cigarettes. The definitions for what constitutes a cigarette vary at the state level. While most states are expected to tax HeatSticks as cigarettes, that may not be the case in every state. For example, in Minnesota, HeatSticks will be taxed as other tobacco products. Most states are currently in the process of formulating taxation strategies for heated tobacco products in order to have a tax in place by the time heated tobacco products are sold throughout the United States.

Strengths and Limitations of Different Tobacco Tax Structures

Historically, tobacco products in the United States were taxed primarily for the purpose of revenue generation. However, as the evidence on the deleterious health consequences of tobacco use grew in conjunction with growing evidence on the effects of taxes on tobacco consumption, the federal and state governments began increasing tobacco taxes to not only raise revenue, but to discourage tobacco use as well. The tobacco tax structure in the United States reflects the government's interest in both raising revenue and decreasing the harm caused by tobacco use. Economic theory predicts that the type of tax structure that the government employs will be instrumental in determining how much revenue will be generated and how much harm will be reduced from excise tax increases.[1]

For products that are relatively homogeneous, a specific tax on tobacco products is relatively easier to administer, and hence has a lower cost of administration, than an *ad valorem* tax. For a specific tax it is straight forward to count the amount of product being sold (i.e number of packs, weight, or volume) as long as the government uses a precise definition of exactly what comprises one unit of quantity. Price-based *ad valorem* taxes require administrators to calculate the value of the tobacco product and therefore requires more administrative effort and increased costs of administration. Manufacturers can manipulate the prices of products to avoid higher tax payments under an *ad valorem* structure, whereas there is no incentive to manipulate price under a specific tax structure.

Government tax revenues are more predictable when using a specific tax as compared to an ad valorem tax. Specific tax revenue depends solely on the demand for tobacco products by consumers and does not depend on industry pricing strategies The revenues generated from an *ad valorem* tax are sensitive to the manufacture's pricing decisions; *ad valorem* tax revenues rise when tobacco prices rise and fall when the industry cuts prices.

When using a specific tax, the same tax applies to low-price tobacco products as to high-price tobacco products. Therefore, when a specific tax is increased, it usually results in a similar price increase for both low-price and high-price tobacco products. An identical price increase for low- and high- price products results in the same price differential between low- and high-price products before and after the tax. This is not the case with *ad valorem* taxes. With *ad valorem* taxes, a tax increase raises the price of low-end products less than it raises the price of high-end products resulting in a larger price differential between low- and high-end products after the tax as compared to before the tax. This increase in price variability after an *ad valorem* tax increase will likely lead to greater opportunities for tax avoidance, may lead tobacco users to switch from high end tobacco products to low end tobacco products, and likely reduce the effect of taxation on tobacco consumption. Moreover, when an *ad valorem* tax is increased, there is an incentive for manufacturers to produce lower-priced products, and hence lower quality products, because *ad valorem* taxes are tied to price. The greater availability of low price/low quality products may be particularly appealing to youth and low-income individuals, two groups that have been found to have more price elastic demands for tobacco products than the general population.

One advantage of an *ad valorem* tax over a specific tax is that the *ad valorem* tax automatically adjusts for inflation since it is directly tied to the product price. Because a specific tax is not tied to the price of a product, inflation erodes the value of a specific tax over time. To adjust for inflation, governments must periodically increase the specific tax. In addition, in a market where there is considerable heterogeneity among products, as in the e-cigarette market, an *ad valorem* tax has the benefit of creating a more level playing field across products.

Challenges with E-cigarette Taxation

To understand the challenges with implementing and collecting taxes on e-cigarettes, we relied primarily on semi-structured phone interviews with tax authorities responsible for implementing these taxes. Several states required us to submit our questions via e-mail instead of having a phone interview, and one state required us to fill out an open records request to obtain the information we requested. The information on e-cigarette tax challenges were collected between July 2019 and January 2022. and focused primarily on states that had enacted e-cigarette taxes prior to July 2021 since these states would have a much better grasp of challenges post tax enactment. Our first question regarding challenges was open ended and asked about the biggest challenges faced with respect to e-cigarette taxes. Further questions asked more specifically about any challenges faced related to enacting the tax and collecting taxes, challenges with the type of e-cigarettes that were being taxed, and challenges with tax avoidance and tax enforcement. Frequently noted challenges are described below.

One challenge for states and localities is how to classify e-cigarettes for tax purposes. According to the Family Smoking Prevention and Tobacco Control Act, electronic cigarettes are tobacco products, unless that product makes a therapeutic claim, in which it is a drug or device.[3] Indeed, most taxing states classify e-cigarettes as tobacco products. Some states however, including CT, GA, KS, KY, OH, VA, WA, WI, and WY, classify e-cigarettes as unique non-tobacco products to be taxed. Among the states that do classify e-cigarettes as tobacco products, two states (CA and ME) tax them at a rate equivalent to the combined rate of taxes applied to cigarettes; four states (MN, NV, OR, VT) and DC tax e-cigarettes at the same rate as other tobacco products (OTP); and fifteen states (CO, IL, IN, MD, MA, NH, NM, NY, PA, DE, LA, NJ, NC, UT, and WV) tax e-cigarettes at different rates than cigarettes and other tobacco products.

The choice on how to tax vaping products - an equivalent rate to cigarettes, an equivalent rate to OTP, or a unique tax - often depends on the state's objective for implementing the tax. Some researchers argue that the level of taxation on tobacco products should directly correspond to the health risks that those products impose onto users.[2] If states are contemplating using a vaping products tax based on relative harm, they may want to enact a tax that is high enough to discourage youth use while at the same time increasing taxes on cigarettes and other tobacco products to increase the price differentials between products in order to incentivize tobacco users who are unable to quit entirely to switch from more harmful to potentially less harmful products.

Among the nine states that apply only a specific tax on the ml of consumable product, five states (DE, LA, NC, OH, and VA) only tax the number of ml of liquid if it contains nicotine; consumable product that does not contain nicotine is not taxed. This type of strategy for e-cigarette taxation creates an incentive for tax avoidance by retailers. That is, retailers have an incentive to purchase and pay taxes on a relatively small amount of highly concentrated nicotine solution and that consumers can then mix with untaxed non-nicotine solution, such as solutions that contain flavorings, and avoid paying taxes on the total ml of consumable product. If a portion of the consumable product is not taxed, it will be relatively less expensive to produce the final consumable liquid (compared to the entire solution being taxed) and will likely result in lower prices being charged for e-cigarette liquid. These lower prices translate into increased consumption and may encourage the use of e-cigarettes by more price sensitive consumers.

The choice of tax structure, *ad valorem* versus specific, imposes a unique challenge for e-cigarettes. An *ad valorem* tax may treat disposable e-cigarettes differently than non-disposable e-cigarettes that use refillable e-liquids. The price to purchase a disposable e-cigarette is less expensive than the price to purchase a re-useable e-cigarette. Therefore, the consumer pays less tax purchasing the disposable e-cigarette than purchasing the re-useable e-cigarette. However, there is also a differential tax associated with using the devices. The *ad valorem* tax on a disposable e-cigarette is calculated based on the price of the e-liquid and the value of the device itself. The *ad valorem* tax on a non-disposable product is primarily based on the price of the e-liquid itself, once the tax on

[3] https://www.fda.gov/tobacco-products/products-ingredients-components/vaporizers-e-cigarettes-and-other-electronic-nicotine-delivery-systems-ends

the purchase of the device has been paid. Therefore, the consumer pays more tax using disposable e-cigarettes compared to using re-useable e-cigarette for the same amount of liquid consumed. The specific tax treats the use of disposable and non-disposable e-cigarettes the same since it taxes only the volume of e-liquid that the person purchases. Since many new users do not want to make a larger financial outlay before they've tried electronic cigarettes, many purchase disposable e-cigarettes to start. The choice between *ad valorem* and specific excise tax structures may affect youth e-cigarette initiation and adults who smoke switching from combustible cigarettes to e-cigarettes.

An increasing number of states have made a distinction on how to tax e-cigarettes by the nature of the container in which the e-liquid is sold. For example, New Mexico has a two-tier mixed (i.e. has both a specific and ad valorem tax component) tax on e-liquids. If the e-liquid comes in a closed cartridge (i.e. single use, prefilled cartridge that contains less than 5ml of e-liquid) the tax is a specific tax of $0.50 per cartridge. If the e-liquid is to be used in an open (refillable) device, an ad valorem tax of 12.5% of the value of the e-liquid is imposed. Connecticut also has a two-tier mixed tax. It imposes a specific tax of $0.40 per ml of e-liquid for closed devices such as disposable e-cigarettes, rechargeable cigalikes, and pods and charges an ad valorem tax of 10% on open (refillable) e-cigarette devices and bottled e-liquid. New Hampshire recently implemented a similar tax, with an *ad valorem* rate of 8% of wholesale price on liquids used in open systems and a specific tax of 30 cents per ml on liquids used in closed systems. Georgia also has a two-tier mixed tax, with an *ad valorem* rate of 7% of wholesale price for open devices and disposables and a specific tax of $0.05 per fluid milliliter of consumable product to be used in closed systems. Similarly, Kentucky imposes an ad valorem rate of 15% of wholesale price for open e-cigarette devices and bottled e-liquid and a specific tax of $1.50 per cartridge for closed system e-cigarettes. Moreover, New Jersey imposes an ad valorem rate of 10% of retail price for containers of e-liquid used in open systems and a specific tax of 10 cents per ml for prefilled cartridges or containers intended to be used in an electronic cigarette. Finally, Washington state has a two-tier uniform tax. The specific tax is $0.27 per ml of solution for closed (non-refillable) cartridges and pods containing less than or equal to 5ml of solution and only $0.09 per ml of solution for open (any accessible container of solution greater than 5ml) containers of solution. Washington state's two-tier uniform tax is unique in the sense that it aims for greater equivalence between the higher volume liquids used in open systems and the low-volume, high-nicotine solutions used in nicotine salt-based products such as JUUL. Evidence shows that refillable liquid e-cigarettes (open systems) are primarily used by adults while disposable, cartridge-based and pod-based (closed systems) are favored by minors. Open systems are typically sold in tobacco/vape shops, whereas, closed systems are available in convenience stores, gas stations, etc.

The distribution chain for e-cigarettes is very different than the distribution chain for cigarettes and other traditional tobacco products. The distribution chain for cigarettes and traditional tobacco products is well defined – manufacturers sell to wholesalers/distributors who sell to retailers who sell to consumers. For e-cigarettes, manufacturers, wholesalers/distributors, and retailers are not mutually exclusive. That is, many manufacturers are also wholesalers and retailers at the same time. This poses a challenge to states as to which entity to tax and makes it more difficult for enforcement agencies to make sure taxes are actually being paid on e-cigarettes. Fifteen states (CA, CT, GA, IL, MA, ME, MN, NH, NV, VT, KS, NJ, OH, OR, and WI) impose a tax upon the wholesaler. Three states (NM, NC, WA) and DC impose a tax on the first purchaser (typically defined as the person engaged in business that manufacturers or purchases or receives e-cigarette products). Two states, New York and Maryland, impose the tax on the retailer of e-cigarettes. One state, PA, imposes a tax on whoever sells e-cigarettes to retailers. Two states, Colorado and Utah impose a tax on manufacturers. Two states, Kentucky and Virginia, impose the tax on distributors. Three states (DE, LA, and WV) impose the tax on either the wholesaler or retailer that first acquires an e-cigarette. Wyoming imposes the tax on wholesalers, but if the tax is not paid by wholesalers, then consumers pay the tax at retail. Finally, in Indiana, closed system cartridges will be taxed at the wholesale level, whereas consumable material and e-cigarettes will be taxed at the retail level when the state's tax goes into effect on July 1, 2022. As described above, a majority of states impose a tax on wholesalers. Given the non-traditional distribution channels for e-cigarettes, potentially many taxable transactions are being missed by states if the distribution channel bypasses wholesalers. For example, Minnesota expressed concern that manufacturers of e-cigarettes were selling their products directly to retailers/customers and the state did not have tax provisions in place to cover these types of transactions – tax provisions were only in place for transactions that employed traditional wholesaler distribution.

Tax stamps, barcodes, holograms, and wholesale licenses have been used by states to prevent cigarette and other tobacco tax evasion. In 48 states and DC (ND, and NC do not require tax stamps) licensed wholesalers typically pay the state excise tax for cigarettes and affix a stamp to the package as evidence that the tax has been paid. In addition, barcodes must be present on cigarettes sold in California, Michigan, and New Jersey and holograms/encrypted images must be present on cigarette packs sold in California, Massachusetts, and New Jersey. Currently no states require tax stamps, barcodes, or holograms/encrypted images for e-cigarette products. Without tax stamps, states are finding it difficult to monitor the distribution of e-cigarettes. For example, the Louisiana Office of Alcohol and Tobacco Control (LOATC) stated that because tax stamps are not required to be purchased in advance and affixed to e-cigarettes, monitoring distribution and tax collection efforts was much more challenging than cigarettes. Further, the LOATC stated that a traditional distribution system, presumably including tax stamps, would be met by resistance from e-cigarette wholesalers. For traditional tobacco products, wholesale operations are automated and designed to sort and ship products packaged in standard sizes. For e-cigarettes, there is no standard packaging and taxpayers would be required to manually handle the products, or, invest in new technology to automate, both of which would be costly.

Licenses to sell e-cigarettes are not required in all of the states that tax e-cigarettes. Five states that tax e-cigarettes including Kentucky, Virginia, West Virginia, Wisconsin, and

Wyoming do not require licenses for retail sales of e-cigarettes. Delaware requires licensure for retailers selling consumable product, but does not require a license to sell e-cigarette devices. States that do not require a license to sell e-cigarettes are having trouble determining who is actually distributing/selling e-cigarettes.

Even when states require licenses to sell e-cigarettes, many challenges related to tax collection are faced by states. Despite requiring licenses, states have had problems identifying their tax base (i.e. which businesses are in the business of selling e-cigarettes). Despite informational campaigns aimed at manufacturers, distributors, and retailers and searches for business that sell e-cigarettes, many revenue departments do not have complete lists of all sellers in their states. For example, the Kansas Department of Revenue (KDOR) expressed a strong concern that it did not know exactly which businesses were distributing consumable material at any given point in time. The KDOR finds out who is distributing e-cigarettes each month when they receive a required monthly report from wholesalers. Unfortunately, the KDOR has realized that many distributors of e-cigarettes fail to submit the monthly reports, other distributors submit the required monthly reports periodically (i.e. not every month as required by law), and some distributors submit the monthly report each month, but sometimes do not pay the taxes due. North Carolina also had difficulty identifying its tax base. Despite doing a business key word search, meeting with North Carolina vape associations, and meeting with tobacco wholesale organizations, the North Carolina Department of Revenue (NCDOR) had trouble figuring out who their tax base was. The NCDOR sent letters to 3,550 retailers from their keyword searches informing them of license requirements and how to file their tax returns, but many e-cigarette dealers on their list were still not paying taxes. Another problem NCDOR faced trying to figure out their tax base was that some sellers had store names that were not related to e-cigarettes or tobacco and hence, did not make their list; others retailers would go in and out of business before they were caught by the NCDOR; and finally other businesses changed owners before taxes were paid. The District of Columbia is another example that struggles with the identification of a tax base. Sellers of e-cigarettes in DC are required to obtain a license from the District of Columbia Department of Consumer and Regulatory Affairs (DCDCRA). The District of Columbia Department of Tax and Audit (DCDTA) receives the quarterly tax return from e-cigarette sellers. DCDCRA does not provide a list of e-cigarette sellers to DCDTA on a regular basis. DCDTA only finds out about who is selling e-cigarettes when they receive quarterly tax returns. Taxes can be avoided by sellers if they do not submit a quarterly tax return because DCDTA might not know they exist. Louisiana experienced a similar issue early on where the Louisiana Office of Alcohol and Tobacco Control (LOATC), not the Louisiana Department of Revenue (LDOR), issued permits to e-cigarette sellers and then shared this list of permits with the LDOR. From August 2015 through September 2017 less than 100 e-cigarette retailers were filing monthly tax returns with the LDOR. After September 2017, e-cigarette retailers are required to register with the LDOR. This has decreased tax evasion in Louisiana.

Another challenge for states that require licenses to sell e-cigarettes is that many sellers are manufacturers, wholesalers, and retailers at the same time. These sellers are unsure of which license they must obtain in order to conduct business. North Carolina faced this problem. Initially in North Carolina, sellers that engaged in the manufacture, distribution, and sale of e-cigarettes to consumers were required to purchase 3 separate permits. Given the confusion among e-cigarette sellers, NC altered its policy so that only a wholesaler's permit was required for firms that were manufacturers, wholesalers, and retailers at the same time.

Illinois also had difficulty identifying and notifying all the businesses in the state that were selling electronic cigarettes on the new taxes that were being imposed on e-cigarettes. Since businesses selling electronic cigarettes were not required to have a license or register with the state prior to the e-cigarette tax being enacted, the state did not have a list of businesses to notify regarding the tax changes. Colorado has had trouble identifying businesses selling nicotine products to consumers online. These online businesses are not licensed, do not pay taxes, and do not file appropriate PACT Act reports. The state of New York has had some difficulty with retailers regarding the need to register with the Department of Revenue. Registration makes it easier for retailers to have the e-cigarette tax automatically attached to each e-cigarette transaction. Some registered retailers in New York have even had trouble because they have antiquated point of sale machines that could not easily calculate the new tax. Wyoming also had difficulty identifying and notifying all the businesses in the state that were selling e-cigarettes that they needed to obtain a license in order to sell e-cigarettes. The inability to contact all the businesses that sell e-cigarette resulted in the Wyoming excise tax department receiving many calls from businesses regarding the need to obtain a license. Kentucky also had trouble identifying their tax base. Not knowing which entities were selling e-cigarettes led to problems licensing sellers and ensuring compliance with the new e-cigarette tax.

Other states faced challenges with counterfeit products being sold in their states. New Jersey noted that there was a proliferation of counterfeit products being sold in their state. The counterfeit products are difficult to detect as they are comingled with taxed e-cigarettes. Local departments of health are not consistently enforcing the prohibition on flavored e-cigarettes which has led to significant flavored e-cigarettes being sold in stores without taxes being applied. The flavored e-cigarette sales are typically pushed off the books to the black market. In New Jersey, there is a widespread opposition to the flavor ban among both consumers and retailers. Inspections of retail locations suggest that retailers are opposing the flavor ban passively by simply ignoring it. The e-cigarette tax is then being evaded by non-reporting, which is really intended to conceal the flavored nature of the product and not the taxable sales. More evidence of untaxed counterfeit products being sold in New Jersey is the number of phone calls the New Jersey Department of Treasury receives reporting flavored e-cigarettes being sold across the state.

Washington State has also had challenges with taxpayers complying with the e-cigarette tax. In Washington, the Liquor Cannabis Board enforces the e-cigarette tax and reports violators to the Department of Revenue. In 2021, 15 businesses have been reported as violators of the e-cigarette tax, but this is likely to be a significant undercount of the number of violators because the Liquor Cannabis Board is conducting a much lower number of inspections than originally planned due to the Covid 19 pandemic.

States were also challenged incorporating the new e-cigarette tax into their existing tax structures. For example, Illinois was challenged changing the current excise tax on other tobacco products to include electronic cigarettes on forms (primarily the TP-1 Tobacco Products Tax Return Form), schedules, and rules. These changes affected not only internal systems for employees of the Illinois Department of Revenue, but also affected external systems that are utilized by taxpayers.

Another challenge that states have encountered is an inexact definition of final consumable product to be taxed. In Minnesota the consumable product must contain nicotine. Some e-cigarette sellers in Minnesota pay taxes on only the nicotine solution that they acquire and not on the final consumable product that they sell. In an effort to avoid taxes, some distributors in Minnesota purchase and pay taxes on a specific volume of a concentrated nicotine solution. These distributors mix this highly concentrated nicotine solution with a non-nicotine non-taxed solution (i.e. flavoring liquids, etc.) to create a much larger volume of final consumable product of which much of the liquid is not taxed. Had the distributors paid taxes on the entire volume of the final consumable product, and not just the highly concentrated nicotine solution, the revenue generated would have been higher. A concern relating to the mixing of solutions was expressed by Louisiana. Louisiana stated that they were concerned about the safety of additives that were mixed at the retail level to form the final consumable liquid without any supervision or control. New Jersey has also expressed a concern regarding their recently implemented two-tier mixed tax, where bottled e-liquids are taxed on a new ad valorem basis of 10%. The concern is that there is likely to be significant under reporting of the retail sales made to consumers under the new container e-liquid tax. In some states, consumable product does not need to contain nicotine, but it is required to be consumed in an electronic cigarette device. A challenge for Kansas and North Carolina, who do not require nicotine in their consumable product, is that some distributors are claiming they do not know what their customers are doing with the solutions they sell and they might not be using them in an e-cigarette device and therefore they are not required to pay taxes on those solutions. Examples of solutions that Kansas and North Carolina have provided were Cannabidiol (CBD) oils and flavoring solutions.

Illinois had some challenges with the taxation of non-nicotine products and devices that fell under the definition of electronic cigarettes. For example, some products met the definition of electronic cigarettes but were also taxable under the privilege taxes on adult use and medical cannabis cultivation and the excise tax on cannabis purchasers. To clarify which products should be taxed as electronic cigarettes, the Illinois General

Assembly passed Public Act 102-0575 making these products not subject to the tax on electronic cigarettes.

New Jersey had challenges educating taxpayers on the different taxes imposed on different e-cigarettes. Indeed, New Jersey taxes at a rate of 10% of retail price on containers of e-liquid to be used in open e-cigarette systems and $0.10 per ml for prefilled cartridges. Taxpayers were initially confused as to which products fall under the liquid nicotine tax, which products fall under the container e-liquid tax, and which products such as CBD pods and cartridges do not fall under either tax. The definition of a nicotine product in the state of Colorado is very clear: "A nicotine product is a product that contains nicotine derived from tobacco or created synthetically that is intended for human consumption, whether by vaporizing, chewing, smoking, absorbing, dissolving, inhaling, snorting, sniffing, aerosolizing, or by any other means and is not a cigarette, a tobacco product as defined in section 39-28.5-101(5), C.R.S., or a drug, device or combination product authorized for sale by the US Department of Health and Human Services, as defined in the Federal Food, Drug and Cosmetic Act 21 U.S.C. Sec. 301 et seq." However, the Colorado legislation enacting the nicotine tax included tax percentage differences between non-modified risk and modified risk nicotine products, which has led to confusion by taxpayers. Some taxpayers believe that some of the nicotine products are modified risk nicotine products, however, there are no products available to purchase in Colorado on the FDA's list of modified risk products that meet Colorado's definition of a nicotine product. In New York, there was some initial confusion on exactly which e-cigarettes were to be taxed. In New York, e-liquid is subject to the supplemental sales tax. There was some confusion regarding whether or not e-cigarettes that contained e-liquid should be taxed as a whole or only the e-liquid inside the devices should be taxes. The Department of Taxation and Finance (DTF) quickly decide to tax the device and liquid together as a whole. The New York DTF reported that it is very easy to collect taxes and review/audit retailers using this approach of taxing the device and liquid together as a whole. Kentucky also faced challenges with the type of e-cigarettes being taxed. The Kentucky Department of Revenue had lots of trouble informing sellers about the differences between open and closed e-cigarette products and the structure of the taxes for these different types of e-cigarettes.

Another challenge states faced was abiding by the Preventing Online Sales of E-Cigarettes to Children Act. On March 28, 2021, the Preventing Online Sales of E-Cigarettes to Children Act amended the PACT Act and Jenkins Act to include electronic nicotine delivery devices. Under the new law, the U.S. Postal Service cannot accept or transmit any package that it knows, or has reasonable cause to believe, contains e-cigarettes or any of the other prohibited devices, accessories or component parts. There are limited exceptions to the new rule for noncontiguous states, business/regulatory purposes, consumer testing, public health purposes and limited individual shipments. In order for online retailers of electronic nicotine products to be in compliance of new shipping requirements, they are now required to (among other things) register with each state and local tax administrator where business takes place or advertisements and offers are disseminated; adhere to all federal, state and local recordkeeping, reporting, filings and excise tax requirements; and provide a monthly list of every transaction to each state's tax administrator where it conducts business. One challenge that the state of Illinois mentioned was difficulty registering businesses to comply with the PACT act. A second challenge Illinois faced was collecting the monthly PACT Act reports (PA-2) from businesses selling e-cigarettes. Colorado also had challenges adhering to the amended Federal PACT act as it related to nicotine products because it created a great deal of unexpected work for the Colorado Department of Revenue.

Numerous states reported challenges with e-cigarettes being purchased from other states. Pennsylvania identified out-of-state e-cigarette companies as a problem for both enforcement and administration of the taxes. With respect to enforcement, Pennsylvania does not have the means to visit out-of-state companies, especially those across the country, and therefore reporting and taxation typically do not occur on products sold by these out-of-state companies. North Carolina reported a challenge collecting taxes and licensing sellers who sell e-cigarettes over the internet, but do not have a physical presence in North Carolina. North Carolina noted that they rarely receive revenue from out of state internet sales. New Jersey also had trouble collecting taxes from out of state sellers. However, revisions to the Federal PACT Act (described above) actually made it easier for New Jersey to collect out of state sales taxes because sellers had to comply with state tax obligations under Federal law. The largest challenge with respect to the nicotine products tax in Colorado is getting out-of-state entities who sell nicotine products in Colorado to get licensed. Colorado's statute specifically requires the collection of the tax from the entity that receives the nicotine product in Colorado and therefore Colorado cannot impose the tax on unlicensed out-of-state distributors selling to Colorado consumers or retailers. Revisions to the Federal PACT Act allowed the Colorado Department of Revenue to receive reports from unlicensed out-of-state entities that reported delivery sales to Colorado consumers and Colorado retailers. When these out-of-town entities refuse to obtain a Colorado Nicotine Product license, The Department of Revenue is required to obtain the tax due, by statute C.R.S 39-28.6-107(4)(a), from the Colorado consumers that purchased the items. Not surprising, the Colorado consumers who purchased nicotine for out-of-state sources are not happy to get an unexpected tax bill from the state of Colorado.

Several states reported that the state legislatures passed the e-cigarette tax suddenly which led to problems. For example, the North Carolina legislature passed the consumable products tax suddenly and without getting input from the NCDOR or other agencies. NCDOR scrambled to get everything ready to implement the tax and only had time to lump the consumable products tax with the other tobacco products (OTP) tax. Many tweaks and adjustments were required by NCDOR in order to lump consumable product with the existing OTP tax collection system. The problem of integrating consumable products within the existing tax collection system was not fully resolved and a new tax collection system exclusively designed to better fit the distribution system for consumable products was introduced in October 2018. The new tax collection system posed challenges as well, as many sellers of consumable products were still using old tax forms for some time. The NCDOR spent additional resources reaching out to consumable product sellers informing them that they were required to use the new forms going forward. Kansas also had initial problems with the consumable materials tax. In fact, the implementation of the tax was delayed as the Department of Revenue met with industry representatives to iron out regulations. The process was bogged down and the consumable material regulations did not get passed until 1/1/2017. Once the regulations were passed the industry provided enough resistance regarding the definition of consumable material that a new definition of consumable material went into effect on 7/1/2017. This posed a problem for a few e-cigarette vendors that paid taxes between 1/1/2017 and 7/1/2017. These vendors were given credits to be used after 7/1/2017.

The Kentucky Department of Revenue (DOR) also faced challenges incorporating electronic filing for e-cigarettes within a very short time frame (approximately 5 months to implement the new tax on e-cigarettes). Issues with the electronic filing system still persist today hindering audit functions by DOR staff. Moreover, the Kentucky DOR did not agree with the statutory language and proposed taxation structure for e-cigarettes. The statutory language that was enacted made it more difficult for the DOR due to the bifurcation of the open and closed systems and different tax rates applied to each. The Kentucky DOR preferred a simpler taxation of just the liquid solution and one tax rate. Moreover, the Kentucky DOR did not have adequate staff to handle the new reporting requirements associated with the e-cigarette tax. In the state of Washington many legislatures were unhappy with the enacted tax on e-cigarettes and four bills have been introduced to increase the e-cigarette tax and change the structure of e-cigarette taxes in Washington subsequent to the original tax being enacted.

Another challenge for states was making pertinent e-cigarette tax information available to all affected parties at the time the tax was enacted. Louisiana had challenges educating their staff and informing potential taxpayers of the upcoming changes. Despite issuing several documents for the general public including the Electronic Cigarette Frequently Asked Questions list and the informational bulletin FY 2019-20 New Tax Requirements for Electronic Cigarettes, the state of Illinois initially had some taxpayers not being aware of the new e-cigarette tax and were unintentionally evading the tax. West Virginia had difficulties getting e-cigarette dealers and wholesalers to register with the Department of Revenue and getting the wholesalers or dealers that first acquire or handle the e-liquid to pay taxes. Much of the difficulty was related to a lack of information on the wholesaler and dealer levels. In Pennsylvania, manufacturers and wholesalers are required to file monthly tax returns both electronically and on paper. Despite information efforts by the Pennsylvania Department of Revenue, many of manufacturers only file electronically and not on paper causing problems for the Pennsylvania Department of Revenue.

Educating taxpayers in the state of Washington was one of the state's largest challenges in enacting and collecting the e-cigarette tax. In Washington, the party of first possession of the e-cigarette is responsible for paying the tax. This can be the manufacturer, distributer, retailer, or even the consumer if the consumer purchased the product online from a seller that did not pay the Washington tax or the consumer purchased the product directly outside the state of Washington. There was significant confusion by taxpayers in Washington with respect to who was responsible for paying the tax. Additional confusion among taxpayers in the state of Washington was related to the two-tiered specific excise tax. In Washington open container solution is taxed at $0.09 per ml whereas closed system pods or cartridges with <5ml are taxed at $0.27 per ml. Taxpayers were confused with regard to whether the tax was determined by open vs. closed system or ml of consumable liquid (<5ml vs >=5ml). Shortly after the enactment of the tax the state of Washington informed taxpayers that all accessible containers of consumable product greater than 5ml are taxed at $0.09 per ml and all other e-cigarettes are taxed at $0.27 per ml. Colorado had challenges informing taxpayers on licensing requirements. Taxpayers were confused as to who should obtain a license and who should remit the nicotine taxes. In Colorado, the nicotine tax is imposed on the entity that brought the nicotine into Colorado or manufactured the nicotine in Colorado. Taxpayer confusion stemmed from the fact that taxpayers were unsure if the out-of-state entity was required to have a Colorado Nicotine Product license and pay taxes or the in-state entity that purchased the nicotine was required to obtain a Colorado license and pay the taxes. The Colorado Department of Revenue stated that it is acceptable for either the in-state or out-of-state entity to obtain a license and pay taxes as long as one of the entities is licensed and pays taxes. The confusion surrounding which entity needs to obtain a license and remit taxes has resulted in out-of-state entities selling nicotine products to retailers and residents in Colorado with neither out-of-state nor in-state entity paying nicotine taxes.

Another challenge for states has to do with the floor tax that goes into effect when a e-cigarette tax is enacted. For example, when the tax was enacted in West Virginia, retailers' floor stock (i.e. stock on hand) as of June 20, 2016 could be depleted without paying taxes. However new purchases starting 7/1/2016 were subject to the new tax. Some manufacturers created very large stocks of e-liquids prior to the effective date in an effort to avoid making tax payments. This was the case if the manufacturer only sold at retail because the retail floor stock was exempt from taxes. If, however, the manufacturer sold wholesale from their floor stock, it was NOT exempt, but many manufacturers thought it was. Pennsylvania did not exempt floor stock from taxes when they enacted their e-cigarette tax. The floor tax caused problems for many retailers, manufacturers, and wholesalers who had large inventory, but did not have enough money to pay their taxes on the floor stock. The state of Washington also had challenges with the taxation of e-cigarette floor stock. In Washington a floor tax had to be paid on all e-cigarette inventory as of midnight October 1, 2019. The Department of Revenue relied on businesses to report their inventory honestly. This led to some underreporting of inventory by businesses.

Many states that tax e-cigarette are unable to determine the quantity of products sold in their states and other states are unable to determine how much tax revenue is collected from the sale of e-cigarettes, and still others are unable to determine both sales and revenue. The inability to determine sales and revenue is problematic because they cannot monitor trends in these products over time, which is important for public health and policy purposes. None of the states that apply a specific excise tax is able to determine how many e-cigarettes were sold in their state, some of these states are only able to determine the volume of ml of consumable product that is sold. Other states that apply an *ad valorem* tax on e-cigarettes are unable to produce any measure of volume or quantity sold, and in some, even how much tax revenue is collected from the sale of e-cigarettes. For example, the California Department of Tax and Fee Administration (CDTFA) does not obtain or keep sales or tax information regarding specific types of tobacco products. This is because the required Tobacco Products Distributor Tax Return submitted to the CDTFA by tobacco products distributors does not differentiate between the different types of tobacco products. Another example is Pennsylvania, where the Pennsylvania Department of Revenue does not maintain any records regarding sales volumes for e-cigarettes or other types of e-cigarettes. Some state revenue departments, like Minnesota, do not collect revenue or sales data specifically for e-cigarettes, but attempt to estimate the fraction of other tobacco product tax revenue that can be attributed to e-cigarette sales based on assumptions regarding the fraction of OTP revenue that is accounted for by these products.

Some states use words such as "nicotine derived from tobacco" in their definition of tobacco products. Some e-cigarette manufacturers argue that products that use synthetic nicotine (which is synthesized through chemical reactions in a lab and does not come from tobacco) do not meet the definition of tobacco products and therefore e-cigarette that use synthetic nicotine are not subject to taxation in states that use definitions based on nicotine derived from tobacco. Because of this, some states are changing their definition of tobacco products. For example, on January 1, 2020 Minnesota changed their definition of tobacco products. Prior to January 1, 2020 a tobacco product was defined as "any product containing, made, or derived from tobacco that is intended for human consumption" and "Tobacco products include nicotine solution products" as defined by "any cartridge, bottle,or other package that contains nicotine made or derived from tobacco" Since January 1, 2020 Minnesota defines nicotine solution products as "any cartridge, bottle, or other package that contains nicotine, including nicotine made or derived from tobacco or sources other than tobacco". The new definition includes electronic cigarettes and nicotine solutions that use synthetic nicotine in the definition of tobacco products.

Another challenge for states was having the right political landscape and evidence base in order to enact a tax on e-cigarettes. For example, in the state of New York, numerous attempts to pass e-cigarette taxes failed before finally passing as part of the state's fiscal 2019-2020 budget. The initial failures to pass an e-cigarette tax were attributed to a lack of evidence on youth e-cigarette use rates and a lack of interest by incumbent politicians. By FY2018/2019 evidence of a dramatic rise in youth e-cigarette use rates in New York in conjunction with the legislature in New York becoming a majority Democratic allowed the passage of the e-cigarette tax. New York was also challenged by the type of e-cigarette tax that was initially proposed. The e-cigarette tax that was initially proposed was an excise tax based on ml of nicotine content. New York quickly realized that there was no standard for measuring the nicotine content in e-cigarettes and that the proposed laboratory testing of all e-cigarettes was prohibitively expensive and wasteful. New York revised the structure of the e-cigarette tax to be an *ad valorem* tax which was deemed a much easier tax to administer. The total a*d valorem* tax on e-cigarette in New York is 28% of retail price (20% e-cigarette tax + 8% state sales tax).

A final challenge for states has to do with the e-cigarette lobby that pressures legislators to change aspects of the e-cigarette tax. For example, in Pennsylvania the e-cigarette lobby put a lot of pressure on the legislature to enact a specific (per ml of e-liquid) excise tax rather than an *ad valorem* tax. As mentioned above, lobbyist for the e-cigarette industry were successful in changing the definition of a consumable product in Kansas. Moreover, in Washington, Representative Gerry Pollet blames pressure from lobbyists for ultimately getting lawmakers to change his proposal to a tiered per-milliliter rate. Further, Kansas had passed a 20-cent-per-milliliter tax on consumable product in 2015. But before it went into effect in 2017, representatives of the local e-cigarette industry pushed for a 5-cent per-milliliter tax, which lawmakers ultimately passed. There is also evidence that an e-cigarette tax proposal in Colorado in 2019 failed partly because of e-cigarette lobbyists. JUUL Labs Inc and Altria Group sent lobbyists to oppose the legislation, according to Colorado lobbying disclosure reports.

Recommendations for Taxing Emerging Tobacco Products

Given the experiences of jurisdictions that have implemented taxes on e-cigarette in recent years, and the resulting challenges described above, guidance is needed on how to tax these products. This includes guidance on what type of tax to levy, what to tax, where to collect the tax, and at what level to tax. In this section, we provide some recommendations on these issues, noting that these recommendations are based on the current state of the market for and regulation of these products. These recommendations may change as the market evolves and as strong product regulations are implemented.

Specific vs. Ad Valorem Taxation

In general, the best practice for tobacco taxation is to levy specific excise taxes in order to reduce price gaps between different brands of a given tobacco product, limiting consumers ability to trade down to cheaper brands as taxes and prices rise. Research demonstrates that specific cigarette taxes are effective in reducing price gaps, producing more stable and higher tax revenues, and leading to greater reductions in tobacco use.

Specific excise taxes work well when levied on products that are highly similar, such as manufactured cigarettes or little cigars. However, specific taxes can be problematic when applied to highly heterogenous products in that they can lead to significant differences in the taxes applied. For example, smokeless tobacco taxes levied based on product weight can lead to relatively high taxes per unit on traditional smokeless tobacco products, lower taxes on lighter weight snus products, and minimal taxes on very low weight dissolvable tobacco products.

Given the extreme heterogeneity in the types and prices of e-cigarettes, an *ad valorem* excise tax structure appears most appropriate. An *ad valorem* excise tax is most likely to avoid favoring some products over others. For example, a specific tax based on the volume of e-cigarette solution, as applied in many US jurisdictions, can lead to a relatively high effective tax on solutions used in open e-cigarette systems, while resulting in a relatively low tax on low volume, high concentration nicotine salt-based products like JUUL. The resulting increased difference in relative prices would lead some e-cigarette users to switch to the higher concentration products. Some jurisdictions have attempted to address this concern by levying tiered specific taxes that differ based on the type of product. For example, Washington state levies a relatively low tax (nine cents per milliliter) on open container solutions, while levying a higher tax (27 cents per milliliter) on closed pods and cartridges. However, tiered tax structures are more difficult to administer and are likely to need to be frequently adjusted as diverse new products enter the market.

If, in the future, strong product standards that limit nicotine content and volume are implemented, reducing the heterogeneity among products, a specific tax based on volume may be more appropriate. In the European Union (EU), for example, the Tobacco Products Directive limits nicotine concentration to no more than 20 milligrams per milliliter, volume of nicotine solution to containers no larger than ten milliliters, and capacity of refillable tanks to no more than two milliliters. As a result, the range of products available in the EU is more limited than in the US and specific taxation may be more appropriate than *ad valorem* taxation.

In contrast, given the relatively homogeneous 'heat sticks' used in heated tobacco products, levying a specific tax per stick appears most appropriate.

Ad Valorem Tax Base

In the US, state and local *ad valorem* tobacco taxes are generally levied on wholesaler or distributor prices. As described above, many states and localities levy *ad valorem* taxes on other tobacco products, including, in some states, e-cigarettes. This approach is consistent with collecting state and local cigarette excise taxes from wholesalers/distributors. While this works well for cigarettes and other traditional tobacco products, nearly all of which go through a three-tier distribution system (manufacturer/importer, wholesaler/distributor, and retailer), this approach results in considerable challenges for e-cigarettes.

As described above, e-cigarettes are often not distributed through the same type of three-tier distribution system used for traditional tobacco products. This is in part due to the more competitive nature of the e-cigarette market and the much larger number of firms involved. In some cases, e-cigarettes are sold directly by manufacturers to retails, and in others, the retailer can be the manufacturer. Given this, it can often be nearly impossible to determine an appropriate wholesaler/distributor price.

Given this challenge, levying an *ad valorem* excise tax based on the tax-inclusive retail price for e-cigarettes seems most appropriate. This minimizes the potential for tax avoidance resulting from transfer pricing schemes in which the tax is levied at an earlier stage (e.g. based on manufacturer's price) where the price is set artificially low resulting in a low tax. Levying the tax based on the tax-inclusive retail price ensures that the price the consumer sees includes the tax and, as a result, has the greatest impact on consumer behavior.

While no US jurisdiction implements this type of tax on e-cigarettes, governments in other countries have done so. For example, Indonesia imposes an excise tax on e-cigarettes that is 57 percent of the tax inclusive retail price. Others, such as Saudi Arabia, Bahrain, and the United Arab Emirates, levy the tax based on the pre-tax retail price. For example, Saudi Arabia imposes a 200 percent tax on the pre-tax retail price, which amounts to a 66.67 percent tax on the tax-inclusive retail price. In the US, New York's e-cigarette tax comes closest, levied as a tax of 20% on retail price.

Taxing Devices and/or Components

Most governments in the US and globally that levy taxes on e-cigarettes do not tax e-cigarette devices and/or their components. The relatively few governments that do tax devices and/or their components face enormous challenges defining exactly what is subject to the tax, given the diversity of devices and components available on the market. While some devices are well defined (e.g. disposable and re-useable e-cigarettes, JUUL devices), others are not. Indeed, e-cigarette enthusiasts have demonstrated endless creativity in developing open systems using a variety of components, ranging from soda cans and liquor flasks to cigarette lighters and handheld gaming devices. While all e-cigarette devices use some type of battery, defining what batteries to tax to be inclusive enough to capture those used in e-cigarettes, but not so inclusive as to tax batteries that are used for other purposes seems particularly challenging.

Given the diversity of devices and components used in e-cigarettes, levying excise taxes on devices/components poses considerable tax administration challenges in defining exactly what is taxable and what is not taxable. Given these challenges, if governments choose to tax devices/components, in order to avoid confusion in the application of the tax, the definitions should explicitly state which e-cigarette products and components are covered, with definitions broad enough to anticipate and capture innovations as new products enter the market.

Taxing E-Liquids

Every jurisdiction that taxes e-cigarettes levies a tax on some variation of the liquid used in the product. That said, there is considerable variation in exactly what is taxed and what is not. Some tax only liquids containing nicotine, while others tax any liquid used in the product. Of those that tax nicotine-containing liquids, some tax only those containing nicotine derived from tobacco, while others tax any nicotine-containing liquid regardless of the source of the nicotine. At least one government (Latvia) levies a tax based on nicotine content.

To date, there are no easily implemented tests to determine whether or not an e-liquid contains nicotine, how much nicotine it contains, and/or the source of that nicotine. Instead, rigorous laboratory testing is needed. Given the myriad varieties of e-liquids available in the market, laboratory testing of all products would be expensive and time-consuming and would need to be conducted frequently given how quickly new products are entering the market. Taxing only e-liquids containing nicotine is likely to generate substantial tax avoidance, with high-nicotine concentration liquids subject to the tax that can be diluted with non-nicotine containing e-liquids that are not subject to the tax.

Given the inherent difficulties with determining whether or not e-liquids contain nicotine, how much nicotine they contain, and/or the source of that nicotine, the most effective approach appears to be taxing all liquids used in the product. This approach would ease the burden on tax administrators while reducing opportunities for tax avoidance and evasion. Again, if/when strong product standards are implemented that regulate the volume and nicotine concentration of liquids used in the products, a different approach may be more appropriate.

For products that include both the device and e-liquid (e.g. disposable e-cigarettes or re-usable starter kits that include the e-cigarette device and pods/cartridges), levying the tax on the retail price of the product seems most appropriate. This eliminates the need for tax administrators to try to determine the value of the e-liquid separately.

Where to Collect the Tax

As discussed above, the distribution chain for e-cigarettes is quite different from the distribution chain for cigarettes and other traditional tobacco products. In contrast, given that most heated tobacco products are produced by large multinational tobacco companies, these products are much more likely to go through the same distribution chain used for their cigarettes and other products.

The non-traditional distribution chains for e-cigarettes creates considerable challenges for collecting taxes on these products given that most of the taxes currently implemented in various US jurisdictions aim to collect these taxes from wholesalers/distributors. In the end, tax authorities need to collect at least some, if not most of the taxes on e-cigarettes from retailers, given that many e-cigarettes are sold directly from manufacturers/importers to retailers. This creates difficulties in trying to determine which products were already taxed earlier in the distribution chain and on which products the tax needs to be collected from the retailer.

To simplify tax collection, collecting the e-cigarette taxes from retailers appears to be the best option. To date, two states – New York and Maryland – are doing this. This is also consistent with the recommendations above about levying an *ad valorem* tax based on the tax-inclusive retail price. Additionally, nearly all states levy sales taxes that are collected from retailers. In many states, there are complex sales tax systems that impose different tax rates on favored and disfavored products (e.g. exempting or imposing lower taxes on favored products, such as foods and beverages). In some states (e.g. Maryland), special sales taxes are applied to alcoholic beverages. The existence of these systems suggests that collecting excise taxes on e-cigarettes at the point-of-sale based on retail price is highly feasible.

To facilitate this, taxing jurisdictions would ideally have policies requiring outlets selling e-cigarettes to be licensed so that they would have a complete list of retailers from which to collect the tax.

On-line vendors pose a unique challenge in collecting these taxes, given the sizable market share for e-cigarettes that are sold on-line. A similar challenge existed in the past with on-line cigarette sales. This problem was eventually resolved as a result of agreements between states' Attorneys General and shipping companies, credit card companies, and Internet payment services, as well as the Federal Jenkins and PACT Acts. The recent amendments to the PACT and Jenkins Act should help to address this challenge, although implementation remains an issue, as described above.

Tax Rates

Existing taxes on e-cigarettes vary widely in terms of the effective tax rates. Several states impose very low specific taxes – as low as five cents per milliliter in Delaware, Kansas, Louisiana, North Carolina, and Wisconsin. Rarer are high specific taxes, such as the tax of $1.50 per container plus $1.20 per milliliter levied in Chicago. *Ad valorem* tax rates vary widely as well, from eight percent of wholesale price on open systems in Georgia and New Hampshire to 95 percent of wholesale price in Minnesota. Taxing jurisdictions also vary in the relative taxes on e-cigarettes, with some states, such as California and Minnesota, setting tax rates to achieve parity with taxes on cigarettes, while others have no clear objective.

Differences in taxes across different products can lead some users to substitute from products taxed at higher rates to products taxed at lower rates. Some have argued that taxing e-cigarettes at a lower rate than conventional cigarettes could reduce the overall harms from tobacco use by encouraging some people who smoke to switch to e-cigarettes. However, the growing evidence on the respiratory, cardiovascular, and other consequences of e-cigarette use suggests that it will be decades before there is clarity on the net public health effects of this type of substitution, something further complicated by the rapid changes in e-cigarette products.

Given this, taxing all tobacco products at the same rate as cigarettes are taxed appears most appropriate at this time. The average tax burden on cigarettes is relatively easy to determine from existing data; the annual *Tax Burden on Tobacco* produced by Orzechowki and Walker, for example, includes data on average cigarette prices and state cigarette taxes, as well as the share of price accounted for by taxes. Following the recommendations above for e-cigarette taxes, the *ad valorem* tax rate on the tax-inclusive retail price could be set at the same rate as the share of price accounted for by the taxing jurisdictions tax. For heated tobacco products, the tax per 'heat stick' could be set at the same specific tax rate as the specific tax per cigarette. For other tobacco products that are taxed based on wholesale price, the tax could be set at the same rate as the cigarette tax is based on wholesale cigarette prices, a rate that the Campaign for Tobacco-Free Kids regularly updates based on wholesale cigarette prices and state OTP taxes.

Table 14 contains estimates of the state tax rates for e-cigarettes that would achieve parity with state cigarette taxes, as share of the tax-inclusive and tax-exclusive retail price, based on estimated average cigarette prices and state cigarette taxes as of January 1, 2022. Cigarette price estimates are based on the average cigarette prices as of November 1, 2020 reported in the 2021 *Tax Burden on Tobacco*, updated to reflect industry price increases and state cigarette tax increases since November 2020. Table 14 also includes the equivalent *ad valorem* tax rate levied on the wholesale price of cigarettes, as reported by the Campaign for Tobacco-Free Kids.[4]

Table 14

Estimated *Ad Valorem* Tax Rates to Achieve Parity with Average Cigarette Tax Rates

Based on Estimated Average Cigarette Price, June 1, 2022

State	Parity Based on Tax-Inclusive Retail Price	Parity Based on Tax-Exclusive Retail Price	Parity Based on Wholesale Price
Alabama	10.21%	11.37%	12%
Alaska	19.13%	23.65%	36%
Arizona	24.69%	32.79%	36%
Arkansas	16.48%	19.74%	21%
California	32.28%	47.66%	51%
Colorado	24.99%	33.32%	35%
Connecticut	39.90%	66.38%	77%
Delaware	26.91%	36.82%	38%
DC	38.28%	62.03%	80%
Florida	18.60%	22.84%	24%
Georgia	6.06%	6.45%	7%
Hawaii	31.98%	47.01%	57%
Idaho	8.90%	9.76%	11%

[4] https://www.tobaccofreekids.org/assets/factsheets/0169.pdf

Illinois	31.18%	45.30%	53%
Indiana	14.95%	17.58%	18%
Iowa	19.41%	24.08%	25%
Kansas	18.33%	22.45%	23%
Kentucky	16.83%	20.24%	20%
Louisiana	16.11%	19.20%	20%
Maine	24.58%	32.59%	36%
Maryland	38.73%	63.21%	67%
Massachusetts	33.58%	50.55%	63%
Michigan	25.62%	34.45%	36%
Minnesota	28.97%	40.79%	54%
Mississippi	10.73%	12.02%	13%
Missouri	2.90%	2.99%	4%
Montana	21.87%	27.99%	31%
Nebraska	9.87%	10.95%	12%
Nevada	23.25%	30.29%	32%
New Hampshire	23.03%	29.92%	32%
New Jersey	31.24%	45.42%	48%
New Mexico	24.92%	33.19%	36%
New York	37.82%	60.82%	77%
North Carolina	7.30%	7.88%	8%
North Dakota	7.05%	7.59%	8%
Ohio	21.49%	27.37%	29%
Oklahoma	25.59%	34.40%	36%
Oregon	35.54%	55.13%	59%
Pennsylvania	28.90%	40.64%	46%
Rhode Island	38.84%	63.51%	76%
South Carolina	8.85%	9.72%	11%
South Dakota	20.01%	25.02%	28%
Tennessee	9.70%	10.74%	11%
Texas	19.66%	24.46%	25%
Utah	21.66%	27.64%	31%
Vermont	32.26%	47.62%	55%
Virginia	8.74%	9.58%	11%
Washington	31.79%	46.60%	54%
West Virginia	17.34%	20.98%	22%
Wisconsin	29.90%	42.66%	45%
Wyoming	9.11%	10.02%	11%
Federal	13.30%	15.34%	18%

To put these rates in context, Table 15 contains estimates of the dollar value of the tax applied to selected e-cigarettes, based on prices observed on-line and using the cigarette-parity *ad valorem* tax rates on tax-exclusive retail price estimated in Table 14. These include the price of a four pack of JUUL pods ($15.99, JUUL website), a Blu disposable e-cigarette ($7.99, Blu website), a Blu Plus+ tank kit (device and 3 tanks, $14.99, Blu website), and 30 milliliters of the average price for low-cost e-liquids used in open systems ($10.75, various sources).

Table 15

Estimated Tax on Selected E-cigarettes, Based on Cigarette-Parity *Ad Valorem* Rates

June 1, 2022

State	JUUL Pods, 4 pack	Blu Disposable E-Cigarette	Blu Plus+ Tank, with 3Cartridges	E-Liquid, 30 ml
Alabama	$1.82	$0.91	$1.70	$1.22
Alaska	$3.78	$1.89	$3.54	$2.54
Arizona	$5.24	$2.62	$4.92	$3.53
Arkansas	$3.16	$1.58	$2.96	$2.12
California	$7.62	$3.81	$7.14	$5.12
Colorado	$5.33	$2.66	$4.99	$3.58
Connecticut	$10.61	$5.30	$9.95	$7.14
Delaware	$5.89	$2.94	$5.52	$3.96
DC	$9.92	$4.96	$9.30	$6.67
Florida	$3.65	$1.83	$3.42	$2.46
Georgia	$1.03	$0.52	$0.97	$0.69
Hawaii	$7.52	$3.76	$7.05	$5.05
Idaho	$1.56	$0.78	$1.46	$1.05
Illinois	$7.24	$3.62	$6.79	$4.87
Indiana	$2.81	$1.40	$2.64	$1.89
Iowa	$3.85	$1.92	$3.61	$2.59
Kansas	$3.59	$1.79	$3.36	$2.41
Kentucky	$3.24	$1.62	$3.03	$2.18
Louisiana	$3.07	$1.53	$2.88	$2.06
Maine	$5.21	$2.60	$4.89	$3.50
Maryland	$10.11	$5.05	$9.47	$6.79
Massachusetts	$8.08	$4.04	$7.58	$5.43
Michigan	$5.51	$2.75	$5.16	$3.70

Minnesota	$6.52	$3.26	$6.11	$4.38
Mississippi	$1.92	$0.96	$1.80	$1.29
Missouri	$0.48	$0.24	$0.45	$0.32
Montana	$4.48	$2.24	$4.20	$3.01
Nebraska	$1.75	$0.88	$1.64	$1.18
Nevada	$4.84	$2.42	$4.54	$3.26
New Hampshire	$4.78	$2.39	$4.49	$3.22
New Jersey	$7.26	$3.63	$6.81	$4.88
New Mexico	$5.31	$2.65	$4.98	$3.57
New York	$9.73	$4.86	$9.12	$6.54
North Carolina	$1.26	$0.63	$1.18	$0.85
North Dakota	$1.21	$0.61	$1.14	$0.82
Ohio	$4.38	$2.19	$4.10	$2.94
Oklahoma	$5.50	$2.75	$5.16	$3.70
Oregon	$8.82	$4.40	$8.26	$5.93
Pennsylvania	$6.50	$3.25	$6.09	$4.37
Rhode Island	$10.15	$5.07	$9.52	$6.83
South Carolina	$1.55	$0.78	$1.46	$1.04
South Dakota	$4.00	$2.00	$3.75	$2.69
Tennessee	$1.72	$0.86	$1.61	$1.15
Texas	$3.91	$1.96	$3.67	$2.63
Utah	$4.42	$2.21	$4.14	$2.97
Vermont	$7.61	$3.80	$7.14	$5.12
Virginia	$1.53	$0.77	$1.44	$1.03
Washington	$7.45	$3.72	$6.98	$5.01
West Virginia	$3.36	$1.68	$3.15	$2.26
Wisconsin	$6.82	$3.41	$6.39	$4.59
Wyoming	$1.60	$0.80	$1.50	$1.08
Federal	$2.45	$1.23	$2.30	$1.65

Conclusions

The emergence of a variety of new tobacco products in recent years has raised several questions about how best to tax these products. Most governments have been slow to respond, with taxes on e-cigarettes only starting to be implemented in recent years. Many states have yet to adopt these taxes and those that have are taking diverse approaches with respect to tax structure and tax rates. Earlier implementers largely followed the approach used for taxing traditional tobacco products but have faced a variety of challenges. Based on their experiences, it is becoming clearer how to most efficiently and practically implement these taxes. That said, as the markets for these products continue to evolve and new regulations are implemented, best practices for taxation are also likely to evolve.

Suggested Citation

Chaloupka, F.J. & Tauras, J.A. (2022). Taxation of Emerging Tobacco Products: 2022 Update. Tobacconomics. https://tobacconomics.org/research/taxation-of-emerging-tobacco-products-2022-update/

About Tobacconomics

Tobacconomics is a collaboration of leading researchers who have been studying the economics of tobacco control policy for nearly 30 years. The team is dedicated to helping researchers, advocates and policymakers access the latest and best research about what's working—or not working—to curb tobacco consumption and the impact it has on our economy. As a program of the University of Illinois at Chicago, Tobacconomics is not affiliated with any tobacco manufacturer. Visit www.tobacconomics.org or follow us on Twitter https://twitter.com/Tobacconomics.