

Supplement 3. Results of the Menthol Status Quo and Menthol Ban Scenarios by Gender

Public Health Impact under the Base Case Status Quo and Menthol Ban Scenarios

Table S3.1 presents the 2021-2080 US menthol and non-menthol smoking and NVP prevalence, deaths, and LYLs for males and females ages 18-99. Results from 2026 and 2080 are presented to display short-term and long-term changes. The results are generally greater in relative terms for females due to their higher rates of menthol cigarette use relative to total cigarette use. Under the Status Quo Scenario, adult (ages ≥ 18) menthol smoking prevalence declines from 5.8% in 2021 to 4.7% in 2026, 2.5% in 2060, and 2.3% in 2080 for males and from 5.1% in 2021 to 4.3% in 2026, 2.3% in 2060, and 2.1% in 2080 for females, while non-menthol smoking prevalence declines from 8.5% in 2021 to 6.7% in 2026, 3.2% in 2060, and 3.0% in 2080 for males and from 5.8% in 2021 to 4.6% in 2026, 2.1% in 2060, and 1.9% in 2080 for females. The adult (ages ≥ 18) prevalence of NVP users (both exclusive NVP use who initiated from never users and who switched from current smokers) increases from 4.5% in 2021 to 5.8% in 2026, 7.0% in 2060, and 6.7% in 2080 for males and from 2.7% in 2021 to 3.5% in 2026, 4.6% in 2060, and 4.5% in 2080 for females. Cumulative SVADs by 2080 include 13.3 million males and 5.6 million females, translating to 128.7 million male and 52.1 million female LYLs.

Under the Menthol Ban Scenario, adult menthol smoking prevalence declines to 0.36% in 2026, 0.08% in 2060, and 0.06% in 2080 for males and to 0.32% in 2026, 0.08% in 2060, and 0.05% in 2080 for females, while non-menthol smoking prevalence increases to 9.6% in 2026 and declines to 4.9% in 2060 and 4.7% in 2080 for males and to 7.2% in 2026, 3.6% in 2060, and 3.3% in 2080 for females. The prevalence of NVP users increases from 4.5% in 2021 to 7.0% in 2026, 8.8% in 2060, and 8.7% in 2080 for males and from 2.7% in 2021 to 4.5% in 2026, 6.0% in 2060, and 5.9%

in 2080 for females. Cumulative SVADs by 2080 include 12.8 million males and 5.2 million females, translating to 119.9 million male and 46.3 million female LYLs.

Comparing two scenarios by 2080, combined menthol and non-menthol smoking prevalence falls from 5.3% under the status quo to 4.7% with a menthol ban for males (a 12% relative reduction) and from 4.5% to 3.4% for females (a 16% relative reduction). The 2080 NVP prevalence under the status quo and menthol ban are 6.7% and 8.7% for males (a 28% relative increase) and 4.5% and 5.9% for females (a 31% relative increase). Cumulative SVADs are reduced in relative terms by 4.8% (0.5 million males; 0.4 million females), and LYLs are reduced by 8.1% (8.8 million males; 5.9 million females).

Sensitivity analysis by Gender

Table S3.2 contains the sensitivity analysis broken down by gender for 2021-2080. The impacts are of the same sign and similar in magnitude by gender.

Table S3.1. Smoking and NVP Prevalence, Smoking and Vaping Attributable Deaths, Life-Years Lost and Public Health Impact, By Gender, Ages 18 and Above, 2021-2080

		Status Quo Scenario							
		MALE				FEMALE			
Category	Category/Year	2021	2026	2080	Cumulative Impact*	2021	2026	2080	Cumulative Impact*
Prevalence	Never smoker	59.7%	62.1%	74.6%	24.8%	68.6%	70.1%	80.6%	17.5%
	Menthol smoker	5.8%	4.7%	2.3%	-60.5%	5.1%	4.3%	2.1%	-58.0%
	Nonmenthol smoker	8.5%	6.7%	3.0%	-64.6%	5.8%	4.6%	1.9%	-67.3%
	All Smokers	14.3%	11.5%	5.3%	-62.9%	10.9%	9.0%	4.0%	-63.0%
	Former smoker	21.3%	19.9%	5.5%	-74.1%	17.6%	17.0%	5.3%	-70.0%
	Exclusive NVP user	3.2%	4.4%	6.7%	107.3%	1.9%	2.6%	4.5%	140.7%
	Former smoker-NVP user	1.2%	1.4%	0.1%	-92.8%	0.8%	0.9%	0.0%	-94.6%
	All NVP users	4.5%	5.8%	6.7%	51.4%	2.7%	3.5%	4.5%	68.6%
Smoking and vaping attributable deaths	Former NVP user	0.3%	0.7%	7.9%	2701.4%	0.2%	0.4%	5.5%	3276.7%
	Menthol smoker	51,083	48,519	14,418	1,890,627	26,372	25,616	9,360	1,121,377
	Nonmenthol smoker	83,797	72,531	15,858	2,394,995	38,445	33,593	6,648	1,092,127
	Former smoker	135,834	144,048	79,873	8,489,954	39,964	45,443	35,047	3,193,375
	Exclusive NVP user	19	121	5,678	161,689	0	7	2,032	49,320
	Former smoker-NVP user	3,595	5,243	1,044	292,867	1,416	1,926	282	89,084
	Former NVP user	0	0	8,471	103,008	0	0	2,012	20,015
	Total	274,328	270,461	125,341	13,333,141	106,198	106,585	55,381	5,565,296
Life-years lost	Menthol smoker	899,390	825,693	247,314	29,925,719	435,860	416,319	137,035	16,755,027
	Nonmenthol smoker	1,353,358	1,149,146	291,808	38,155,336	596,145	506,597	104,072	16,116,945
	Former smoker	1,057,982	1,100,435	353,622	51,734,688	265,265	304,025	136,985	16,846,000
	Exclusive NVP user	809	4,870	100,442	3,892,184	12	301	35,871	1,143,231
	Former smoker-NVP user	64,156	89,255	7,603	3,676,535	21,659	28,449	1,862	1,044,549
	Former NVP user	0	2	69,694	1,291,683	0	0	15,941	223,195
	Total	3,375,694	3,169,401	1,070,483	128,676,145	1,318,941	1,255,691	431,765	52,128,948

Menthol Ban Scenario									
		MALE				FEMALE			
Category	Category/Year	2021	2026	2080	Cumulative Impact *	2021	2026	2080	Cumulative Impact *
Prevalence	Never smoker	59.7%	61.7%	71.5%	19.7%	68.6%	69.9%	78.6%	14.5%
	Menthol smoker	5.8%	0.4%	0.06%	-99.0%	5.1%	0.3%	0.05%	-98.9%
	Nonmenthol smoker	8.5%	9.6%	4.6%	-46.0%	5.8%	7.2%	3.3%	-42.7%
	All Smokers	14.3%	9.9%	4.7%	-67.4%	10.9%	7.5%	3.4%	-68.9%
	Former smoker	21.3%	20.6%	5.4%	-74.7%	17.6%	17.6%	5.1%	-71.3%
	Exclusive NVP user	3.2%	5.0%	8.6%	167.4%	1.9%	3.1%	5.9%	215.9%
	Former smoker-NVP user	1.2%	7.0%	0.1%	-93.5%	0.8%	1.4%	0.0%	-95.3%
	All NVP users	4.5%	2.5%	8.7%	94.6%	2.7%	4.5%	5.9%	120.6%
Former NVP user	0.3%	0.7%	9.8%	3382.3%	0.2%	0.5%	7.1%	4197.3%	
Smoking and vaping attributable deaths	Menthol smoker	51,083	4,409	593	191,539	26,372	2,383	406	112,181
	Nonmenthol smoker	83,797	102,113	22,792	3,362,569	38,445	49,186	10,546	1,639,431
	Former smoker	135,834	145,339	78,048	8,593,659	39,964	45,759	33,871	3,223,907
	Exclusive NVP user	19	121	6,866	187,603	0	7	2,535	59,603
	Former smoker-NVP user	3,595	7,769	994	366,910	1,416	2,871	287	119,809
	Former NVP user	0	0	9,619	115,086	0	0	2,384	23,325
	Total	274,328	259,751	118,912	12,817,367	106,198	100,206	50,030	5,178,256
Life-years lost	Menthol smoker	899,390	73,193	7,609	2,926,131	435,860	38,484	4,655	1,629,769
	Nonmenthol smoker	1,353,358	1,647,004	431,304	53,915,986	596,145	756,752	172,661	24,563,267
	Former smoker	1,057,982	1,117,480	339,399	52,464,097	265,265	307,513	128,309	17,004,012
	Exclusive NVP user	809	4,888	126,185	4,583,213	12	301	45,857	1,394,673
	Former smoker-NVP user	64,156	126,070	6,746	4,504,128	21,659	41,963	1,619	1,397,786
	Former NVP user	0	2	82,415	1,472,556	0	0	19,179	263,239
	Total	3,375,694	2,968,636	993,659	119,866,111	1,318,941	1,145,014	372,281	46,252,745

Difference between Menthol Status Quo and Menthol Ban Scenario									
Relative Reduction in Prevalence**	Menthol Smoker	-	-92.5%	97.5%	-	-	-92.5%	97.4%	-
	Nonmenthol Smoker	-	42.1%	52.3%	-	-	54.8%	75.4%	-
	All Smokers	-	-13.6%	12.1%	-	-	-16.0%	15.9%	-
	All NVP users	-	19.3%	-28.48%	-	-	27.8%	-30.8%	-
Gain***	Averted Deaths	-	10,710	6,429	515,774	-	6,378	5,352	387,041
	Averted life-years lost	-	200,764	76,824	8,810,034	-	110,676	59,484	5,876,203

Notes: NVP= nicotine vaping product, All smokers = combined menthol and non-menthol smokers. All NVP users= combined exclusive NVP user and Former smoker-NVP. * The cumulative impact is measured in terms of the relative change from 2021-2080 for prevalence rates (i.e., (2080-2021)/2021) and the sum of the smoking and vaping attributable deaths or life years lost over the years 2021 through 2080. ** Relative reduction in prevalence is measured as the relative difference between the menthol status quo scenario and the menthol ban scenario, (i.e. (post ban – pre ban)/pre ban) in year 2026 and 2080. ***The gain is measured as the increase in the averted deaths and life-years lost from menthol status quo scenario to the menthol ban scenario.

Table S3.2. Sensitivity analysis of averted Smoking- and Vaping-Attributable Deaths and Life-Years Lost to NVP relative risks and individual transition parameters, by Gender, All ages, 2021-2080

Case	Description	Male	% change*	Female	% change*
Smoking- and Vaping-Attributable Deaths Averted by Menthol Ban					
1	Base Case with NVP at 15% of cigarette excess mortality risk	515,774	-	387,041	-
2	NVP risk at 5% of cigarette-attributable excess mortality risk	555,890	7.8%	407,128	5.2%
3	NVP risk at 25% of cigarette-attributable excess mortality risk	476,966	-7.5%	367,632	-5.0%
4	Reduce overall smoking initiation rates by 10%	492,456	-4.5%	375,725	-2.9%
5	Increase overall smoking initiation rates by 10%	538,612	4.4%	398,195	2.9%
6	Reduce overall smoking cessation rates by 10%	552,875	7.2%	426,704	10.2%
7	Increase overall smoking cessation rates by 10%	481,478	-6.6%	351,375	-9.2%
8	Menthol cessation rate same as non-menthol rate	365,869	-29.1%	249,117	-35.6%
9	Reduce overall switching rate by 10%	531,301	3.0%	395,418	2.2%
10	Increase overall switching rate by 10%	500,827	-2.9%	378,863	-2.1%
11	Reduce the annual decline in switching rate from 10% to 0%	343,320	-33.4%	276,755	-28.5%
12	Menthol switching rate same as non-menthol rate	497,310	-3.6%	378,583	-2.2%
13	Reduce NVP initiation rates by 10%	516,476	0.1%	387,373	0.1%
14	Increase NVP initiation rates by 10%	515,080	-0.1%	386,711	-0.1%
15	Reduce NVP cessation rates by 10%	511,254	-0.9%	383,725	-0.9%
16	Increase NVP cessation rates by 10%	519,756	0.8%	389,873	0.7%

Smoking- and Vaping-Attributable Life-Years Lost Averted by Menthol Ban					
1	Base Case with NVP at 15% of cigarette excess mortality risk	8,810,034	-	5,876,203	-
2	NVP risk at 5% of cigarette-attributable excess mortality risk	9,612,620	9.1%	6,224,771	5.9%
3	NVP risk at 25% of cigarette-attributable excess mortality risk	8,019,249	-9.0%	5,532,609	-5.8%
4	Reduce overall smoking initiation rates by 10%	8,216,462	-6.7%	5,610,351	-4.5%
5	Increase overall smoking initiation rates by 10%	9,390,532	6.6%	6,137,958	4.5%
6	Reduce overall smoking cessation rates by 10%	9,301,606	5.6%	6,340,918	7.9%
7	Increase overall smoking cessation rates by 10%	8,345,000	-5.3%	5,446,548	-7.3%
8	Menthol cessation rate same as non-menthol rate	6,589,665	-25.2%	4,084,214	-30.5%
9	Reduce overall switching rate by 10%	9,079,730	3.1%	6,002,244	2.1%
10	Increase overall switching rate by 10%	8,550,484	-2.9%	5,753,223	-2.1%
11	Reduce the annual decline in switching rate from 10% to 0%	5,650,284	-35.9%	4,158,632	-29.2%
12	Menthol switching rate same as non-menthol rate	8,456,217	-4.0%	5,737,726	-2.4%
13	Reduce NVP initiation rates by 10%	8,827,421	0.2%	5,884,035	0.1%
14	Increase NVP initiation rates by 10%	8,792,859	-0.2%	5,868,437	-0.1%
15	Reduce NVP cessation rates by 10%	8,730,705	-0.9%	5,829,304	-0.8%
16	Increase NVP cessation rates by 10%	8,881,787	0.8%	5,917,713	0.7%

Notes: NVPs= nicotine vaping products; % change is in terms of the relative difference from the base case, (e.g., (687,209-654,221)/654,221 for case 2 relative to case 1.

