Thank you for giving me a chance to speak today

My name is Benjamin Nguyen, I am the co-owner of Cloud 49 Vapor Lounge in Eagle River, Alaska. I have been an avid smoker of traditional cigarettes for a long time. I am now 31 and have been smoke free for a little over two years. I have tried to quit several times due to bleeding gums, and well that basically gave me a wake up call. Knowing how I don't have medical insurance, gave me quite a scare. Even a worst case scenario might be lurking around the corner concerning to my health. My cousin from Texas introduce me to Ecigs, and thanks to him I am feeling better with no more bleeding gums.

From my experience I truly believe that traditional cigarettes is not the true addiction, but more so the habit that goes along with cigarettes. Something I would like to call "muscle memories" of hand to mouth motion. From my insight and experiences, traditional cigarette gave me a chance to break away from my busy schedule for a moment of relaxation to rejuvenate my mind. During that break even though it might be only for 5-15mins would feel like time has frozen.
For people that works a long 9 to 5 or even those that works longer hours. Those breaks are what keeps them going. That is why I used to smoke, but I am pretty sure most smokers will say the same thing. With that scenario, people that switch to vaping will still take it outside on their own, just so they can have a private break

You see most of my customer switch to electronic vaporizer, majority because it is cheaper, and a ~~little bit to~~ health benefits. Studies I have included with this letter. Most of the Alaska workforces belongs to the low income bracket. Let me play some numbers for you. 31% of Alaskan smoke traditional cigarettes. Lets say that all of them are low incomes families. Did you know an average married couple spends anywhere from $100 to $300 a week on traditional cigarettes. Switching electronic vaporizers will save them a little over $200 a week. In one month they could be saving anywhere from $500-$800 a month. Now imagine 31% of Alaskan has all switched to electronic vaporizers. Not only will it strengthen our low incomes families, but also cut the cost medical expenditures associated with traditional cigarettes. I will submit a research article done by the State Budget Solutions on how this Vaping Industries will save millions of dollars on medicaid. Even the Ex-Surgeon General, Dr. Richard Carmona has jumped on board to back the electronic vaporizers industries.

See the why reason I mention all this is because this industries has the potential to do many things for our community, that outweigh the cause for scare. Potential so great that it should be given more time and more effort to learn and to understand. If I came along and told you that I found the cure for cancer, wouldn't you take the time to study and hear what I have to offer? Well I'm here now, telling you we have something that could stop possibly stop it at its source. Please take the time and consideration to all this.

In closing I understand that this bill is simply a bill that request people to take smoking outside. But incorporating electronic vaporizer into this bill will cause a domino effect that would demeanor the effort into helping people quit traditional cigarettes. for that reason i do not agree with SB1 in its current FORM

STATE BUDGET SOLUTIONS POLICY ANALYSIS

MARCH 31, 2015

E-Cigarettes Poised to Save Medicaid Billions

J. Scott Moody, Chief Executive Officer and Chief Economist

Electronic cigarettes (e-cigs) have only been around since 2006, yet their potential to dramatically reduce the damaging health impacts of traditional cigarettes has garnered significant attention and credibility. Numerous scientific studies show that e-cigs not only reduce the harm from smoking, but can also be a part of the successful path to smoking cessation.

The term "e-cig" is misleading because there is no tobacco in an e-cig, unlike a traditional, combustible cigarette. The e-cig uses a battery-powered vaporizer to deliver nicotine via a propylene-glycol solution—which is why "smoking" an e-cig is called "vaping." The vapor is inhaled like a smoke from a cigarette, but does not contain the carcinogens found in tobacco smoke.

Unlike traditional nicotine replacement therapy (NRT), such as gum or patches, e-cigs mimic the physical routine of smoking a cigarette. As such, e-cigs fulfill both the chemical need for nicotine and physical stimuli of smoking. This powerful combination has led to the increasing demand for e-cigs—8.2% use among nondaily smokers and 6.2% use among daily smokers in 2011.[1]

The game-changing potential for dramatic harm reduction by current smokers using e-cigs will flow directly into lower healthcare costs dealing with the morbidity and mortality stemming from smoking combustible cigarettes. These benefits will particularly impact the Medicaid system where the prevalence of cigarette smoking is twice that of the general public (51% versus 21%, respectively).

Based on the findings of a rigorous and comprehensive study on the impact of cigarette smoking on Medicaid spending, the potential savings of e-cig adoption, and the resulting tobacco smoking cessation and harm reduction, could have been up to $48 billion in Fiscal Year (FY) 2012.[2] This savings is 87% higher than all state cigarette tax collections and tobacco settlement collections ($24.4 billion) collected in that same year.

Unfortunately, the tantalizing benefits stemming from e-cigs may not come to fruition if artificial barriers slow their adoption among current smokers. These threats range from the Food and Drug Administration regulating e-cigs as a pharmaceutical to states extending their cigarette tax to e-cigs. To be sure, e-cigs are still a new product and should be closely monitored for long-term health effects. However, given the long-term fiscal challenges facing Medicaid, the prospect of large e-cigs cost savings is worth a non-interventionist approach until hard evidence proves otherwise.

Prevalence of Smoking in the Medicaid Population

According to the Centers for Disease Control and Prevention, in 2011, 21.2% of Americans smoked combustible cigarettes. However, as shown in Table 1, the smoking rate varies considerably across states with the top three states being Kentucky (29%), West Virginia (28.6%), and Arkansas (27%) and the three lowest states being Utah (11.8%), California (13.7%), and New Jersey (16.8%).[3]

Additionally, the smoking rate varies dramatically by income level. Nearly 28% of people living below the poverty line smoke while 17% of people living at or above the poverty line smoke.[4]

As a consequence, the level of smoking prevalence among Medicaid recipients is more than twice that of the general public, 51% versus 21%, respectively. However, this too varies considerably across states with the top three states being New Hampshire (80%), Montana (70%), and Pennsylvania (70%) and the three lowest states being Mississippi (35%), New Jersey (36%), and South Carolina (41%).[5]

In absolute terms, the U.S. Medicaid system includes 36 million smokers out of a total Medicaid enrollment of over 68 million. As such, this places much of the health burden and related financial cost of smoking on the Medicaid system which strains the system and takes away scarce resources from the truly needy.

Economic Benefit of Smoking Cessation and Harm Reduction

Smoking creates large negative externalities due to adverse health impacts. Table 2 shows the results of a comprehensive study that quantified the two major costs of smoking in 2009—lost productivity and healthcare costs.[6]

Lost productivity occurs when a person dies prematurely due to smoking or misses time

from work due to smoking. This cost the economy $185 billion in lost output in 2009.

Table 1
Smokers Represent Significantly Larger Proportion of Medicaid Recipients than General Population
2011

State	Percent Smokers		Medicaid Enrollment	Number of Smokers on Medicaid
	Medicaid	General Population		
United States	51%	21.2% (median)	68,372,045	36,461,209
Alabama	52%	24.3%	938,313	487,923
Alaska	68%	22.9%	135,059	91,840
Arizona	49%	19.2%	1,989,470	974,840
Arkansas	54%	27.0%	777,833	420,030
California	45%	13.7%	11,500,583	5,175,262
Colorado	61%	18.3%	733,347	447,342
Connecticut	49%	17.1%	729,294	357,354
Delaware	58%	21.7%	223,225	129,471
Florida	46%	19.3%	3,829,173	1,761,420
Georgia	42%	21.2%	1,925,269	808,613
Hawaii	62%	16.8%	313,629	194,450
Idaho	62%	17.2%	409,456	253,863
Illinois	58%	20.9%	2,900,614	1,682,356
Indiana	68%	25.6%	1,208,207	821,581
Iowa	61%	20.4%	544,620	332,218
Kansas	54%	22.0%	363,755	196,428
Kentucky	65%	29.0%	1,065,840	692,796
Louisiana	43%	25.7%	1,293,869	556,364
Maine	63%	22.8%	327,524	206,340
Maryland	51%	19.1%	1,003,548	511,809
Massachusetts	53%	18.2%	1,504,611	797,444
Michigan	64%	23.3%	2,265,277	1,449,777
Minnesota	54%	19.1%	989,600	534,384
Mississippi	35%	26.0%	775,314	271,360
Missouri	66%	25.0%	1,126,505	743,493
Montana	70%	22.1%	136,442	95,509
Nebraska	64%	20.0%	284,000	181,760
Nevada	62%	22.9%	363,357	225,281
New Hampshire	80%	19.4%	152,182	121,746
New Jersey	36%	16.8%	1,304,257	469,533
New Mexico	50%	21.5%	571,621	285,811
New York	54%	18.1%	5,421,232	2,927,465
North Carolina	63%	21.8%	1,892,541	1,192,301
North Dakota	63%	21.9%	85,094	53,609
Ohio	65%	25.1%	2,526,533	1,642,246
Oklahoma	58%	26.1%	852,603	494,510
Oregon	67%	19.7%	690,364	462,544
Pennsylvania	70%	22.4%	2,443,909	1,710,736
Rhode Island	48%	20.0%	221,041	106,100
South Carolina	41%	23.1%	978,732	401,280
South Dakota	69%	23.0%	134,798	93,011
Tennessee	58%	23.0%	1,488,267	863,195
Texas	43%	19.2%	4,996,318	2,148,417
Utah	54%	11.8%	366,271	197,786
Vermont	67%	19.1%	184,088	123,339
Virginia	58%	20.9%	1,016,419	589,523
Washington	67%	17.5%	1,371,987	919,231
West Virginia	67%	28.6%	411,218	275,516
Wisconsin	63%	20.9%	1,292,799	814,463
Wyoming	62%	23.0%	76,372	47,351
District of Columbia	51%	20.8%	235,665	120,189

Source: Centers for Disease Control and Prevention, Centers for Medicare and Medicaid Services, and State Budget Solutions

Smokers incur higher healthcare costs when those individuals require medical services such as ambulatory care, hospital care, prescriptions, and neonatal care for conditions caused by smoking. This cost the economy $116 billion in extra medical treatments.

Overall, in 2009 alone, the negative externalities of smoking cost the U.S. economy $301 billion in lost productivity and higher healthcare costs. Not surprisingly, these costs were centered in high population states such as California ($26.9 billion), New York ($20.6 billion), and Texas ($20.4 billion).

Literature Review On E-cig Impact On Harm Reduction Through Reduced Toxic Exposure and Smoking Cessation

E-cigs have only been around since 2006, yet their potential to dramatically reduce the damaging health impacts of traditional combustible cigarettes has garnered significant attention and credibility. Numerous scientific studies are showing that e-cigs not only reduce the harm from smoking, but is also a successful path to smoking cessation.

In perhaps the most comprehensive e-cig literature review to date, Neil Benowitz et al. (2014) identified eighty-one studies with original data and evidence from which to judge e-cig effectiveness for harm reduction.[7] They concluded:

"Allowing EC (electronic cigarettes) to compete with cigarettes in the market-place might decrease smoking-related morbidity and mortality. Regulating EC as strictly as cigarettes, or even more strictly as some regulators propose, is not warranted on current evidence. Health professionals may consider advising smokers unable or unwilling to quit through other routes to switch to EC as a safer alternative to smoking and a possible pathway to complete cessation of nicotine use."

There are two ways that e-cigs benefit current smokers. First, there is harm reduction for the smoker by removing exposure to the toxicity

Table 2
Comprehensive Costs of Smoking
(Billions of Dollars)
2009

State	Lost Productivity			Healthcare Costs	Total Smoking Costs
	Premature Death	Workplace	Total		
United States	117.1	67.5	184.6	116.4	301.0
Alabama	2.7	1.2	3.9	1.7	5.6
Alaska	0.2	0.2	0.4	0.3	0.7
Arizona	1.9	1.3	3.2	1.9	5.1
Arkansas	1.7	0.7	2.4	1.1	3.4
California	9.6	5.7	15.2	11.6	26.9
Colorado	1.3	1.2	2.5	1.6	4.1
Connecticut	1.2	0.7	1.8	1.7	3.6
Delaware	0.4	0.2	0.6	0.4	1.1
District of Columbia	0.3	0.1	0.4	0.5	0.9
Florida	7.9	4.4	12.3	7.3	19.6
Georgia	3.7	2.4	6.2	2.9	9.0
Hawaii	0.4	0.2	0.7	0.4	1.1
Idaho	0.4	0.3	0.7	0.4	1.1
Illinois	5.0	2.9	7.9	4.8	12.7
Indiana	3.0	2.1	5.1	2.6	7.7
Iowa	1.2	0.7	1.9	1.1	3.0
Kansas	1.0	0.6	1.6	1.0	2.6
Kentucky	2.6	1.3	3.9	1.8	5.7
Louisiana	2.4	0.9	3.3	1.8	5.1
Maine	0.6	0.3	0.9	0.7	1.6
Maryland	2.1	1.3	3.4	2.2	5.6
Massachusetts	2.2	1.3	3.4	3.7	7.1
Michigan	4.5	2.4	7.0	4.0	11.0
Minnesota	1.5	1.5	3.0	2.3	5.4
Mississippi	1.8	0.7	2.4	1.0	3.5
Missouri	3.0	1.5	4.5	2.7	7.2
Montana	0.3	0.2	0.6	0.4	0.9
Nebraska	0.6	0.5	1.1	0.7	1.8
Nevada	1.1	0.7	1.7	0.9	2.6
New Hampshire	0.5	0.3	0.8	0.6	1.4
New Jersey	2.9	1.8	4.7	3.6	8.3
New Mexico	0.5	0.4	0.9	0.6	1.5
New York	6.9	3.9	10.8	9.8	20.6
North Carolina	4.1	2.2	6.3	3.4	9.7
North Dakota	0.2	0.2	0.4	0.3	0.7
Ohio	5.7	2.9	8.6	5.2	13.9
Oklahoma	2.1	0.9	3.0	1.3	4.3
Oregon	1.3	0.8	2.1	1.3	3.4
Pennsylvania	5.4	3.2	8.5	5.7	14.2
Rhode Island	0.4	0.2	0.7	0.6	1.3
South Carolina	2.3	1.0	3.3	1.6	4.9
South Dakota	0.3	0.2	0.5	0.3	0.8
Tennessee	3.6	1.7	5.3	2.6	7.9
Texas	7.9	4.9	12.8	7.6	20.4
Utah	0.4	0.3	0.7	0.4	1.1
Vermont	0.2	0.1	0.4	0.3	0.7
Virginia	2.9	2.0	4.8	2.7	7.5
Washington	2.1	1.3	3.4	2.4	5.7
West Virginia	1.1	0.5	1.6	0.9	2.5
Wisconsin	2.0	1.4	3.4	2.4	5.8
Wyoming	0.2	0.2	0.4	0.2	0.6

Source: See Endnote 6 and State Budget Solutions

associated with the thousands of compounds, many carcinogenic, found in the burning of tobacco and the resulting smoke. Second, smoking cessation efforts by the smoker are enhanced by simultaneously fulfilling both the chemical need for nicotine and physical stimuli of smoking.

In the last few years the academic literature has exploded with articles on these two topics. The following is a selection of some of the most recent studies and their conclusions.

Reduced Toxic Exposure

Igor Burstyn (2014) concludes, "Current state of knowledge about chemistry of liquids and aerosols associated with electronic cigarettes indicates that there is no evidence that vaping produces inhalable exposures to contaminants of the aerosol that would warrant health concerns by the standards that are used to ensure safety of workplaces . . . Exposures of bystanders are likely to be orders of magnitude less, and thus pose no apparent concern."[8]

Neal Benowitz, et al. (2013) concludes, "The vapour generated from e-cigarettes contains potentially toxic compounds. However, the levels of potentially toxic compounds in e-cigarette vapour are 9—450-fold lower than those in the smoke from conventional cigarettes, and in many cases comparable with the trace amounts present in pharmaceutical preparation. Our findings support the idea that substituting tobacco cigarettes with electronic cigarettes may substantially reduce exposure to tobacco-specific toxicants. The use of e-cigarettes as a harm reduction strategy among cigarette smokers who are unable to quit, warrants further study."[9]

Kostantinos E Farsalinos et al. (2014) concludes, "Although acute smoking inhalation caused a delay in LV (Left Ventricular) myocardial relaxation in smokers, electronic cigarette use was found to have no such immediate effects in daily users of the device. This short-term beneficial profile of electronic cigarettes compared to smoking, although not conclusive about its overall health-effects as a tobacco harm reduction product, provides the first evidence about the cardiovascular effects of this device."[10]

Smoking Cessation

Emma Beard et al. (2014) concludes, "Among smokers who have attempted to stop without professional support, those who use e-cigarettes are more likely to report continued abstinence than those who used a licensed NRT [Nicotine Replacement Therapy] product bought over-the-counter or no aid to cessation. This difference persists after adjusting for a range of smoker characteristics such as nicotine dependence."[11]

Christopher Bullen et al. (2013) concludes, "E-cigarettes, with or without nicotine, were modestly effective at helping smokers to quit, with similar achievement of abstinence as with nicotine patches, and few adverse events . . . Furthermore, because they have far greater reach and higher acceptability among smokers than NRT [Nicotine Replacement Therapy], and seem to have no greater risk of adverse effects, e-cigarettes also have potential for improving population health."[12]

Pasquale Caponnetto et al. (2013) concludes, "The results of this study demonstrate that e-cigarettes hold promise in serving as a means for reducing the number of cigarettes smoked, and can lead to enduring tobacco abstinence as has also been shown with the use of FDA-approved smoking cessation medication. In view of the fact that subjects in this study had no immediate intention of quitting, the reported overall abstinence rate of 8.7% at 52-weeks was remarkable."[13]

Konstantinos E. Farsalinos et al. (2013) concludes, "Participants in this study used liquids with high levels of nicotine in order to achieve complete smoking abstinence. They reported few side effects, which were mostly temporary; no subject reported any sustained adverse health implications or needed medical treatment. Several of the side effects may not be attributed to nicotine. In addition, almost every vaper reported significant benefits from switching to the EC [e-cigarette]. These observations are consistent with findings of Internet surveys and are supported by studies showing

that nicotine is not cytotoxic, is not classified as a carcinogen, and has minimal effects on the initiation or propagation of atherosclerosis . . . Public health authorities should consider this and other studies that ECs are used as long-term substitutes to smoking by motivated exsmokers and should adjust their regulatory decisions in a way that would not restrict the availability of nicotine-containing liquids for this population."[14]

Potential E-cig Medicaid Cost Savings

To date, the academic literature strongly suggests that e-cigs hold the promise of dramatic harm reduction for smokers simply by switching from combustible tobacco cigarettes to e-cigs. This harm reduction is due to both its positive impact on smoking cessation and reduced exposure to toxic compounds in cigarette smoke.

As a result, we can expect the healthcare costs of smoking to decline over time as the adoption of e-cigs by smokers continues to grow. Additionally, we can expect greater rates of adoption as e-cigs continue to evolve and improve based on market feedback—a dynamic that has never existed with other nicotine replacement therapies.

As discussed earlier, the potential savings to the economy are very large. In terms of healthcare alone, most of that cost is currently borne by the Medicaid system where the prevalence of cigarette smoking is twice that of the general public, 51% versus 21%, respectively. So what are the potential healthcare savings to Medicaid?

Brian S. Armour et al. (2009) created an impressive economic model to estimate how much smoking costs Medicaid based on data from the Medical Expenditure Panel Survey and the Behavioral Risk Factor Surveillance System.[15]

Overall, their model ". . . included 16,201 adults with weighting variables that allowed us to generate state representative estimates of the

Table 3
Smoking Costs on Medicaid by State
(Millions of Dollars)
Fiscal Year 2012

State	Medicaid Spending	Smoking Costs as Percent of Medicaid Spending	Smoking Costs on Medicaid
United States	415,154	11%	45,667
Alabama	5,027	9%	452
Alaska	1,348	15%	202
Arizona	7,905	18%	1,423
Arkansas	4,160	11%	458
California	50,165	11%	5,518
Colorado	4,724	17%	803
Connecticut	6,759	7%	473
Delaware	1,485	10%	148
District of Columbia	2,111	11%	232
Florida	17,907	11%	1,970
Georgia	8,526	10%	853
Hawaii	1,493	11%	164
Idaho	1,452	14%	203
Illinois	13,393	11%	1,473
Indiana	7,486	15%	1,123
Iowa	3,495	10%	350
Kansas	2,667	12%	320
Kentucky	5,702	12%	684
Louisiana	7,358	12%	883
Maine	2,413	14%	338
Maryland	7,687	12%	922
Massachusetts	12,926	11%	1,422
Michigan	12,460	13%	1,620
Minnesota	8,894	11%	978
Mississippi	4,466	9%	402
Missouri	8,727	14%	1,222
Montana	973	15%	146
Nebraska	1,722	15%	258
Nevada	1,739	11%	191
New Hampshire	1,187	15%	178
New Jersey	10,389	6%	623
New Mexico	3,430	12%	412
New York	53,306	11%	5,864
North Carolina	12,282	11%	1,351
North Dakota	744	12%	89
Ohio	16,352	13%	2,126
Oklahoma	4,642	12%	557
Oregon	4,587	15%	688
Pennsylvania	20,393	11%	2,243
Rhode Island	1,856	8%	148
South Carolina	4,848	11%	533
South Dakota	749	16%	120
Tennessee	8,798	11%	968
Texas	28,286	11%	3,111
Utah	1,903	14%	266
Vermont	1,353	15%	203
Virginia	6,906	11%	760
Washington	7,560	18%	1,361
West Virginia	2,790	11%	307
Wisconsin	7,096	13%	923
Wyoming	528	16%	85

Note: States do not sum to Total due to rounding.
Source: See Endnote 15 and State Budget Solutions

adult, noninstitutionalized Medicaid population."

The study concluded that 11% of all Medicaid expenditures can be attributed to smoking. Additionally, among the states these costs ranged from a high of 18% (Arizona and Washington) to a low of 6% (New Jersey).

This study uses their percentage of Medicaid spending due to smoking and applies it to the latest year of available state-by-state Medicaid spending. As shown in Table 3, in FY 2012, smoking cost the Medicaid system $45.7 billion. Of course, the largest states bear the brunt of these costs such as New York ($5.9 billion), California ($5.5 billion), and Texas ($3.1 billion).

To put this potential savings to Medicaid into perspective, in FY 2012, state governments and the District of Columbia combined collected $24.4 billion in cigarette excise taxes and tobacco settlement payments. As shown in Table 4, the potential Medicaid savings exceeds cigarette excise tax collections and tobacco settlement payments by 87%.

However, this varies greatly by state with high ratios in the South Carolina (435%), Missouri (409%), and New Mexico (260%), Arizona (238%), and California (238%) and low ratios in New Jersey (-39%), New Hampshire (-31%), Rhode Island (-17%), Connecticut (-13%), and Hawaii (-4%). Overall, 45 states and D.C. stand to gain more from potential Medicaid savings than through lost cigarette tax collections and tobacco settlement payments.

Note that many of the five states with negative ratios are distorted because excise tax collections are based on where the initial sale occurred and not where the cigarettes were ultimately consumed. This can vary greatly because of cigarette smuggling and cross-border shopping created by state-level differentials in cigarette excise taxes.[16]

For instance, New Hampshire has long been a source for out-of-state cigarette purchase from shoppers living in Massachusetts, Maine, and Vermont because of its lower cigarette excise

Table 4
Smoking Costs on Medicaid Exceeds State Cigarette Tax Collections and Tobacco Settlement Payments
(Millions of Dollars)
Fiscal Year 2012

State	State Cigarette Tax Collections (a)	Tobacco Settlement Payments (b)	Smoking Costs on Medicaid	Smoking Costs on Medicaid as a Percent of State Cigarette Tax Collections and Tobacco Settlement Payments
United States	17,226	7,198	45,667	87%
Alabama	126	94	452	106%
Alaska	67	30	202	108%
Arizona	319	101	1,423	238%
Arkansas	247	51	458	54%
California	896	736	5,518	238%
Colorado	203	91	803	171%
Connecticut	418	124	473	-13%
Delaware	121	27	148	1%
District of Columbia	36	38	232	214%
Florida	381	365	1,970	164%
Georgia	227	141	853	132%
Hawaii	122	49	164	-4%
Idaho	48	25	203	177%
Illinois	606	274	1,473	67%
Indiana	465	130	1,123	89%
Iowa	225	66	350	20%
Kansas	104	58	320	98%
Kentucky	277	102	684	81%
Louisiana	133	141	883	222%
Maine	140	51	338	77%
Maryland	411	146	922	66%
Massachusetts	574	254	1,422	72%
Michigan	965	256	1,620	33%
Minnesota	422	167	978	66%
Mississippi	157	110	402	50%
Missouri	105	135	1,222	409%
Montana	87	30	146	24%
Nebraska	68	38	258	145%
Nevada	103	40	191	34%
New Hampshire	215	43	178	-31%
New Jersey	792	231	623	-39%
New Mexico	75	39	412	260%
New York	1,632	738	5,864	147%
North Carolina	295	141	1,351	210%
North Dakota	28	32	89	49%
Ohio	843	295	2,126	87%
Oklahoma	293	77	557	50%
Oregon	256	79	688	106%
Pennsylvania	1,119	337	2,243	54%
Rhode Island	132	47	148	-17%
South Carolina	26	73	533	435%
South Dakota	60	24	120	42%
Tennessee	279	139	968	131%
Texas	1,470	475	3,111	60%
Utah	124	36	266	66%
Vermont	80	35	203	77%
Virginia	192	117	760	145%
Washington	471	151	1,361	119%
West Virginia	110	64	307	77%
Wisconsin	653	131	923	18%
Wyoming	26	19	85	90%

(a) Includes all forms of tobacco taxes
(b) Includes Master Settlement Agreement and individual state payments.
Source: Department of Commerce: Census Bureau, Internal Revenue Service, and State Budget Solutions

tax. As such, the ratio is too high for Massachusetts, Maine, and Vermont and too low for New Hampshire. The same applies to New Jersey and Connecticut vis-à-vis New York and, more specifically, New York City, which levies its own cigarette tax on top of the state tax.

Hawaii is an exception due to its physical isolation which creates monopoly rents. Rhode Island levies a very high cigarette excise tax, but not relatively high enough compared to neighboring Connecticut and Massachusetts to drive a lot of cross-border shopping.

Other Potential E-cig Cost Savings

Another area of cost savings from greater e-cig adoption is the reduction in smoke and fire dangers in subsidized and public housing. According to a recent study, smoking imposes three major costs:

1. Increased healthcare costs from exposure to second hand smoke within and between housing units.

2. Increased renovation costs of smoking-permitted housing units.

3. Fires attributed to cigarettes.

As shown in Table 5, the study estimates that smoking imposes a nationwide cost of nearly $500 million.[17] The top three states facing the greatest expenses are New York ($125 million), California ($72 million), and Texas ($24 million) while the top three states with the lowest expenses are Wyoming ($0.6 million), Idaho ($0.8 million), and Montana ($1 million).

Applying Cigarette Taxes to E-cigs?

Many policymakers around the country have suggested applying the existing cigarette tax, wholly or in part, to e-cigs. This is bad public policy and is based on a fundamental misunderstanding of the cigarette tax.

The cigarette tax is what economists call a "Pigovian Tax" which is designed to mitigate

Table 5
Smoking Costs on Subsidized and Public Housing
(Millions of Dollars)
2012

State	Smoking Costs
United States	496.8
New York	124.7
California	72.1
Texas	28.3
Massachusetts	24.0
Florida	23.2
Ohio	21.7
Pennsylvania	17.7
New Jersey	15.8
Louisiana	14.4
North Carolina	13.9
Illinois	13.3
Tennessee	12.9
Michigan	12.8
Alabama	12.4
Georgia	11.6
Connecticut	10.7
Missouri	9.4
Indiana	8.3
Virginia	7.8
Mississippi	7.2
Kentucky	7.1
Minnesota	7.1
South Carolina	7.0
Maryland	7.0
Arkansas	6.8
Oklahoma	6.8
Wisconsin	6.5
Washington	5.0
Arizona	4.9
Colorado	4.5
West Virginia	4.3
Oregon	4.3
Maine	4.2
Rhode Island	4.0
Hawaii	3.8
Iowa	3.8
New Mexico	3.0
Kansas	2.9
Nebraska	2.1
Nevada	1.9
Vermont	1.9
New Hampshire	1.9
Utah	1.4
Delaware	1.3
North Dakota	1.2
South Dakota	1.1
Montana	1.0
Idaho	0.8
Wyoming	0.6
Alaska	N.A.
District of Columbia	N.A.

Source: See Endnote 17 and State Budget Solutions

negative externalities of certain actions. Cigarette smoking creates many negative externalities such as harmful health consequences to the user or to those in near proximity (second-hand smoke).

As detailed in this study, the negative externalities associated with traditional smoking are all but eliminated by e-cigs. Without evidence of actual negative externalities, applying the existing cigarette tax to e-cigs is simply bad public policy.

Conclusion

Policymakers have long sought to reduce the economic damage due to the negative health impact of smoking. They have used tactics ranging from cigarette excise taxes to subsidizing nicotine replacement therapies. To be sure, smoking prevalence has fallen over time, but there is more that can be done, especially given the fact that so much of the healthcare burden of smoking falls on the already strained Medicaid system.

As with any innovation, no one could have predicted the sudden arrival into the marketplace of the e-cig in 2006. Since e-cigs fulfill both the chemical need for nicotine and physical stimuli of smoking the demand for e-cigs has grown dramatically. The promise of a relatively safe way to smoke has the potential to yield enormous healthcare savings. The most current academic research verifies the harm reduction potential of e-cigs.

As shown in this study, the potential savings to Medicaid significantly exceeds the state revenue raised from the cigarette excise tax and tobacco settlement payments by 87%. As such, the rational policy decision is to adopt a non-interventionist stance toward the evolution and adoption of the e-cig until hard evidence proves otherwise. While cigarette tax collections will fall as a result, Medicaid spending will fall even faster. This is a win-win for policymakers and taxpayers.

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Article

Quit and Smoking Reduction Rates in Vape Shop Consumers: A Prospective 12-Month Survey

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Abstract: *Aims*: Here, we present results from a prospective pilot study that was aimed at surveying changes in daily cigarette consumption in smokers making their first purchase at vape shops. Modifications in products purchase were also noted. *Design*: Participants were instructed how to charge, fill, activate and use their e-cigarettes (e-cigs). Participants were encouraged to use these products in the anticipation of reducing the number of cig/day smoked. *Settings*: Staff from LIAF contacted 10 vape shops in the province of the city of Catania (Italy) that acted as sponsors to the 2013 No Tobacco Day. *Participants*: 71 adult smokers (≥18 years old) making their first purchase at local participating vape shops were asked by professional retail staff to complete a form. *Measurements*: Their cigarette consumption was followed-up prospectively at 6 and 12 months. Details of products purchase (*i.e.*, e-cigs hardware, e-liquid nicotine strengths and flavours) were also noted. *Findings*: Retention rate was elevated, with 69% of participants attending their final follow-up visit. At 12 month, 40.8% subjects could be classified as quitters, 25.4% as

reducers and 33.8% as failures. Switching from standard refillables (initial choice) to more advanced devices (MODs) was observed in this study (from 8.5% at baseline to 18.4% at 12 month) as well as a trend in decreasing the e-liquid nicotine strength, with more participants adopting low nicotine strength (from 49.3% at baseline to 57.1% at 12 month). *Conclusions*: We have found that smokers purchasing e-cigarettes from vape shops with professional advice and support can achieve high success rates

Keywords: smoking cessation; smoking reduction, electronic cigarette; vape shop, tobacco harm reduction

1. Introduction

Most smokers want to quit and make attempts to do so, but the majority of these attempts fail largely because the powerful addictive qualities of nicotine and non-nicotine sensory and behavioural cues [1,2]. For those willing to quit, combination of pharmacotherapy and intensive behavioural intervention for smoking cessation can support their quit attempts and can double or triple quit rates [3,4]. However, outside the context of rigorous randomized controlled trials, reported efficacy rates are somewhat lower [5–7]. Consequently, the need for novel and more efficient approaches to smoking cessation interventions is unquestionable.

Electronic cigarettes (e-cigs) are an attractive long-term alternative nicotine source to conventional cigarettes because of their many similarities with smoking [8,9] and randomized controlled trials with early generation products have shown that they may assist smokers to remain abstinent during their quit attempt [10,11]. E-cigs come in all sorts of shapes and sizes. Some, commonly referred to as first generation devices, resemble tobacco cigarettes (cigalikes) with a mouthpiece resembling a cigarette filter, a battery and a LED which glows when the user inhales on the device. These devices comprise low-capacity disposable or re-chargeable batteries and combined cartridges and atomisers (cartomisers). Second generation devices often resemble a pen (personal vaporizer) are equipped with high-capacity lithium batteries, a more efficient vaporizing system compared to cigalikes and can be refilled with a wide combination of flavours and nicotine levels. These devices assent to a more fulfilling vaping experience compared to first generation e-cigs with the choice of an extensive number of e-liquid aromas, and thicker vapour [12,13].

Third generation devices (more advanced devices-MODs) bear little visual resemblance to cigarettes, use larger-capacity batteries, replacement heating coils and wicks for atomizers, and adjustable and programmable power delivery.

These products can be purchased in tobacco retail environments, convenience stores, liquor stores, pharmacies, and on the Internet. Shops devoted exclusively to trial and sales of e-vapour products (e.g., refillable and disposable e-cigs, several types of solution strengths and flavours, customizable atomizers and tank systems, and other accessories) are known as "vape shops" and their popularity has been growing in parallel to that of e-cigs [14].

Two randomised controlled trials investigating success rates in smokers asked to try cigalikes have reported disappointingly low quit rates; 4%–8.7% for the ECLAT study in Italy [10] and 4%–7.3% for

the ASCEND study in New Zealand [11]. Not surprisingly, much higher success rates have been reported in clinical trials with refillable penlike e-cigs, with an overall quit rate of 36% at 6 months [15,16]. Nonetheless, it is likely that their performance and appeal as cigarette substitutes can be further improved outside the rigid context of an experimental setting by describing success rates with refillables purchased by smokers at vape shops where professional advice and regular technical support it is also available. Therefore, we hypothesized that vape shops environment together with best matched e-vapour products may promote high success rates in smokers interested in trying this alternative to tobacco smoking. Here, we present results from a prospective pilot study that was aimed at surveying changes in daily cigarette consumption in smokers making their first purchase at vape shops. Modifications in products purchase over time were also noted.

2. Methods

2.1. Participants and Study Design

Adult smokers (≥18 years old) making their first purchase at local participating vape shops were asked by professional retail staff to complete a form with their basic demographic and smoking history details together with scoring of their level of nicotine dependence by means of Fagerstrom Test of Nicotine Dependence (FTND) questionnaire [17]. Participants were instructed how to charge, fill, activate and use their e-cigs. Key troubleshooting was addressed and phone numbers were supplied for technical assistance. Participants were encouraged to use these products in the anticipation of reducing the number of cig/day smoked. Their cigarette consumption was followed-up prospectively at 6 and 12 months. Details of products purchase (*i.e.*, e-cig hardware, e-liquid nicotine strengths and flavours) were also noted. University of Catania Ethics Review Board approved the study protocol and subjects gave consent prior to participation.

2.2. Vape Shops

Staff from Lega Italiana Anti Fumo (LIAF) contacted 10 vape shops in the province of the city of Catania (Sicily) that acted as sponsors to the 2013 No Tobacco Day. Vape shop owners were asked to help with a survey of smokers making their first purchase at their vape shops. Three declined, but seven accepted to be involved. Participating shops were bar or lounge types and displayed a wide range of nicotine in juices, large selection of flavours and hardware (including cigalikes, refillables and MODs).

2.3. Study Outcome Measures

Sustained 50% reduction in the number of cig/day from baseline (*reducers*) was defined as sustained self-reported 50% reduction in the number of cig/day compared to baseline for the 30-day period prior to follow-up visit.

Sustained 80% reduction in the number of cig/day (*heavy reducers*) and sustained smoking abstinence from baseline (*quitters*) were defined as sustained self-reported 80% reduction in the number of cig/day compared to baseline and complete self-reported abstinence from tobacco smoking (not even a puff) for the 30-day period prior to follow-up visit respectively. Smokers who failed to

meet the above criteria and those who were lost to follow-up were categorized as reduction/cessation failures (*failures*).

2.4. Statistical Analyses

Primary and secondary outcome measures were computed by including all enrolled participants and assuming that all those individuals who were lost to follow-up are classified as failures (intention-to-treat analysis). Data were expressed as mean (±SD). One-way Analysis of Variance (ANOVA) was used for detecting differences between means, and χ^2 test for testing differences in variable frequency distributions. Repeated Measures ANOVA was used for detecting differences at different time points.

3. Results

3.1. Participant Characteristics

A total of 71 (M 44; F 27) regular smokers (mean [±SD] pack/years of 32.4 [±13.7]) with a mean (±SD) age of 41.7 (±8.8) years, and mean (±SD) FTND score of 5.6 (±2.2) were enrolled by seven participating vape shops (Table 1). Retention rate was high, with 49 (69%) participants completing all study visits and attending their final follow-up visit at 12 month. Baseline characteristics (sex, age, pack/year, and FTND) of those who were lost to follow-up were not significantly different from those of participants who completed the study.

Table 1. Characteristics of the study sample at enrollment.

	M	F	*p* Value
Sex *n* (%)	44 (62)	27 (38)	
Age (years, mean ± SD)	42.6 ± 8.6	40.4 ± 9.3	0.31
FTND (mean ± SD)	5.6 ± 2.3	5.1 ± 1.9	0.12
Packs/year (mean ± SD)	36.0 ± 14.3	26.5 ± 10.5	0.004
CPD (mean ± SD)	26.5 ± 7.9	22.3 ± 4.6	0.016

CPD: cigarettes per day; FTND: Fagerstrom Test for Nicotine Dependence.

3.2. Changes in Smoking Behaviour

Participants' smoking status at baseline and at 6 and 12 month follow-up visits is presented in Figure 1. Taking the whole cohort of participants (n = 71), the cig/day use changed (mean and range) from 24.9 (15–50) at baseline to 4.0 (0–30) at 6 month and 2.6 (0-15) at 12 month ($p < 0.0001$). At 12 month, 29/71 subjects (40.8%) could be classified as quitters, 18/71 (25.4%) as reducers, of which 11 (15.5%) reduced their cig/day consumption by at least 80% from baseline, and 24/71 (33.8%) were classified as failures, of which 22 (31%) were lost to follow-ups.

Overall, combined smoking reduction and smoking abstinence was shown in 47/71 (66.2%) participants, with a mean (range) of 24.7 cig/day (15–50) at baseline, decreasing significantly to 2.2 cig/day (0–10) at 12 month ($p < 0.0001$), which is equivalent to an overall 89.1% reduction from baseline.

None of the individual characteristics (age, gender, pack/years, FTND) recorded at baseline were a significant predictor the smoking status at the final follow-up visit.

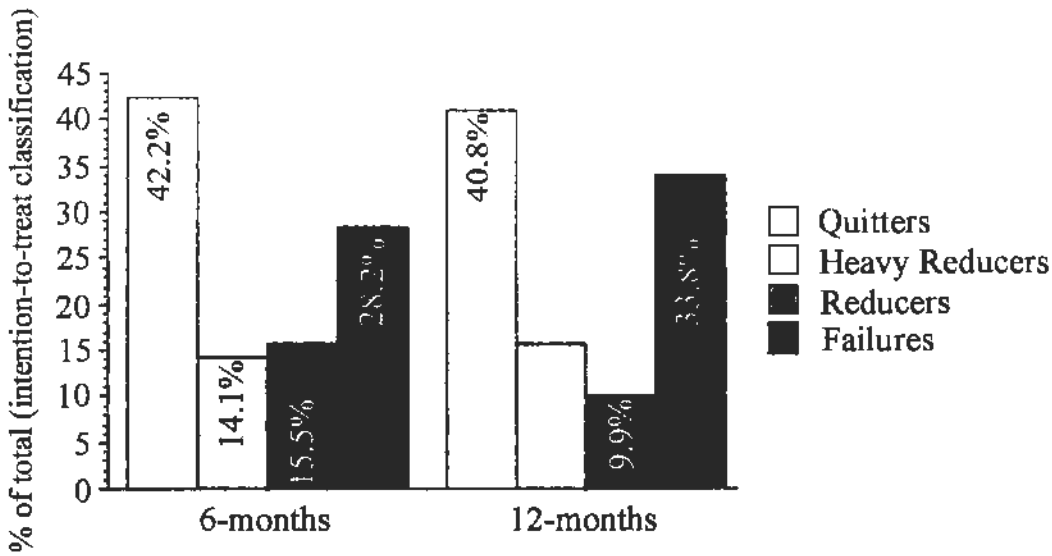

Figure 1. Distribution of smoking phenotype classification (intention-to-treat analysis) at 6 and 12 month follow-up visits.

3.3. Changes in Products Choice

Participants' products choice at baseline and at 6 and 12 month follow-up visits is illustrated in Figure 2.

An increasing percentage of participants switched from standard refillable e-cigs (initial choice) to more advanced devices (MODs) during the study (from 8.5% at baseline to 18.4% at 12 month). Participants also tended to decrease the nicotine strength of their e-liquid with time. More users used a low (4–9 mg/mL) nicotine strength at 12 months, and, less users used a medium (12–18 mg/mL) nicotine strength at 12 month, compared to baseline. Some change did occur too for the preferred flavour used by the participants over time, but most of the participants in our study consistently preferred tobacco flavours over other flavours.

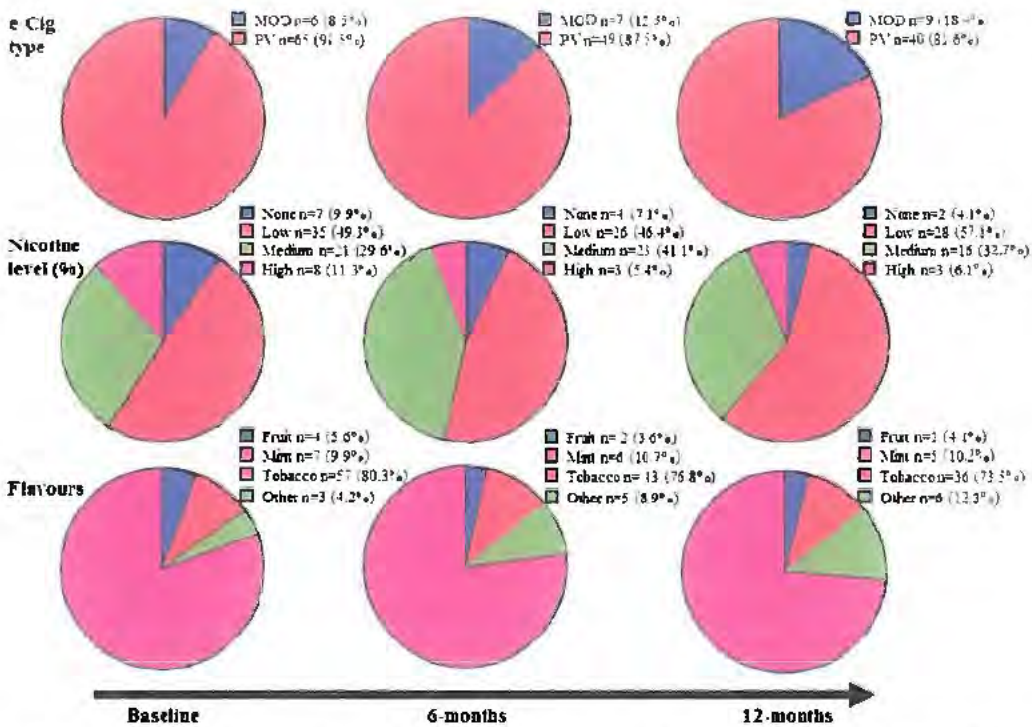

Figure 2. Details of e-Cigs type, e-liquid nicotine strengths (%) and flavours purchased at baseline and at 6 and 12 month follow-up visits. PV: personal vaporizers. MODs: more advanced devices. Low nicotine (4–9 mg/mL), medium nicotine (12–18 mg/mL), high nicotine (19–24 mg/mL).

4. Discussion

E-cigs' success rates have been reported in several clinical trials [10,11,15,16] and Internet surveys [18–20], but never in prospective studies under natural conditions. Here, we present results from the first prospective survey of changes in daily cigarette consumption in smokers making their first purchase at vape shops. The higher success rates observed in this study could reflect both a progress in the type of e-cigs used currently, and a better support and advice from the vape shop staff.

Success rates were not only high, but also stable thorough the whole observation period with quit rates of 42.2% in the intent-to-treat analysis at 6 month barely decreasing to 40.8% at 12 month. The reported quit rates are not only higher than those obtained with pharmaceutical products for the treatment of nicotine addiction [21,22], but also greater than those of first generation cigalikes [10,11] In contrast, similar quit rates were observed in a recent prospective 6-month study with refillable e-cigs [15].

In addition to those quitting completely, 25.4% substantially reduced cigarette consumption. The prevalence of dual use (that is, use of both e-cigs and conventional cigarettes) in our survey is much lower than that reported for cigalikes [18–20]. Although dual use by leading to gradual reduction in cigarette consumption may aid future quit attempts [23,24], it is not known to what extent this behaviour may confer significant reduction in risk and reversal of harm in long-standing dual users.

The large number of consumers still using the product at 12 months (combined single and dual usage was 66.2%) and the high retention rate (69%) in this study may suggest that the products purchased were providing adequate satisfaction. This may be due to several factors including quality hardware, large selection of flavours and nicotine. Nicotine absorption using high quality e-vapour products has been shown to be consistently superior compared to cigalikes [25,26], which is compatible with a better suppression of the withdrawal symptoms. Last but not least, the high success rate in this study may be also attributable to participants self-selection (*i.e.*, smokers well motivated in trying e-cigs and making their first purchase at vape shops).

Nonetheless, about one third of smokers in this study failed to quit or to substantially reduce cigarette smoking with e-cigs. That reasons for failure were not collected in this study, but this could be due to the fact that probably not all smokers could find the adequate hardware-liquidware combination to allow a fulfilling vaping experience or that some unknown factor hindered their use under realistic conditions. It is not excluded also, that some of them may have persisted to use e-cigs, but went to buy their products in other vape shops than the one chosen for this study.

It is interesting that 69% of vape shop consumers went regularly back to their local vape shop for more personalized e-cig support and advice. This loyalty factor is perhaps a key informative finding and suggests that vape shop staff can promote healthier life-style changes in smokers.

As noted in other (internet) surveys, e-cig users tend to adapt their vaping experience over time [13,27]. This is reflected somewhat in the increased percentage of participants who switched from standard refillables (initial choice) to more advanced devices (MODs) in this study (from 8.5% at baseline to 18.4% at 12 month). Similarly, we observed a trend in decreasing the nicotine strength of their e-liquid, with more participants using low nicotine strength at 12 months compared to baseline, and inversely, with less participants using medium nicotine strength at 12 month compared to baseline. This could confirm that nicotine dependence decreases over time with e-cig use, as noted by other investigators [13,28], but cannot

be validated in our study as we did not measure nicotine dependence at 12 month. The change in vaping experience was also the case for the preferred flavour used by the participants over time, although less significant in our study than in others [12,13,20], with the participants in our study consistently preferring tobacco flavours over any other flavour. This may reflect differences in study populations, vape shop consumers representing a more natural condition compared to those responding to online questionnaires.

There are some limitations in our study:

Firstly, this is a small prospective study (already stated in the text), hence the results observed may be due to bias and not due to a true effect; and consequently be interpreted with caution. However, despite being a small study we were able to detect positive significant changes for success outcomes.

Secondly, patients in this study may represent a self-selected sample, which is not representative of all smokers who switch to e-cigs.

Lastly, smoking abstinence was self-reported. However, self-reported number of cigarettes smoked per day in studies of this type is not subjected to the kind of biases observed in clinical trials where there is the tendency to claim abstinence [29].

This small uncontrolled study shows that combination of high quality e-vapour products together with personalized e-cig support and advice at vape shops promotes high success rates in smokers interested in trying this alternative to tobacco smoking. Complete tobacco cessation is the best outcome for smokers, but the powerful addictive qualities of smoked nicotine and of the ritualistic behavior of smoking create a huge hurdle, even for those with a strong desire to quit. Tobacco harm reduction (THR), the substitution of low-risk nicotine products for cigarette smoking, is a realistic strategy for smokers who have difficulty in quitting. E-cigs are the newest and most promising products for THR [30]. This approach has been recently exploited to reduce or reverse the burden of harm in smokers with mental health disorders and chronic airway diseases [31,32]. It is ironic, but the extent of displacement from tobacco smoking to regular vaping will also depend on how efficient e-cigs will become in replicating smokers' smoking experience and how prevalent and helpful will be vape shops. As a matter of fact, substantial public health benefits (*i.e.*, increase in smoking cessation rates and a continued decline in smoking prevalence) are now reported in countries with high prevalence of vaping [33].

Improved products reliability and attractiveness might have contributed to the very low number of lost to follow-up and high success rates thus confirming the notion that these products are attractive substitutes for conventional cigarettes. Although larger longitudinal studies in vape shops are warranted to confirm these encouraging results, the notion that high quality e-vapour products together with personalized e-cig support and advice at vape shops can substantially decrease cigarette consumption, and allow a large number of smokers to quit should be taken into consideration by regulatory authorities seeking to adopt proportional measures for the vapour category [34].

5. Conclusions

Here we have shown for the first time that combining availability of appealing e-vapour products for smoking substitution with professional advice from vape shops staff it is possible to achieve high and stable success rates. By promoting healthier life-style changes in smokers, vape shops may

become valuable allies in the fight against smoking. Larger studies are now needed to confirm these preliminary findings and to establish the importance of integrating these antismoking services into future tobacco control strategies.

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Author Contributions

Riccardo Polosa: Principal investigator involved in the study concept, protocol design, data interpretation and drafting the manuscript. Pasquale Caponnetto: Co-Principal investigators involved in the study concept, protocol design, coordination of the study, data interpretation and revised the manuscript. Fabio Cibella: Carried out the data analyses, was involved in their interpretation and revised the manuscript. Jacques Le-Houezec: Involved in data interpretation and drafted the manuscript. All authors have read and approved the final manuscript.

Conflicts of Interest

Riccardo Polosa has received lecture fees and research funding from Pfizer and GlaxoSmithKline, manufacturers of stop smoking medications. He has also served as a consultant for Pfizer and Arbi Group Srl, an Italian distributor of e-Cigarettes. Riccardo Polosa is currently scientific advisor for LIAF, Lega Italiana Anti Fumo (Italian acronym for Italian Anti-Smoking League). Jacques Le-Houezec is a consultant for Johnson & Johnson France, a manufacturer of nicotine replacement therapy, and was reimbursed for travel and accommodation to present at a conference in Shenzhen (China) organised by the e-cig manufacturer association (CECMOL). Pasquale Caponnetto and Fabio Cibella have no relevant conflict of interest to declare in relation to this work.

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April 9, 2015

SB1

Public Testimony

I speak against passage of SB1. The intent of this bill to protect the public has got to be the biggest hazard con this state has ever witnessed. And I don't understand why big government wants to protect public's rights because the people choose not to or don't have the government powers to do it themselves in their respective communities.

The con is representing secondhand smoke as a hazard when every chemical associated with secondhand smoke falls way under permissible exposure limits, PELs, established by OSHA using the chemical list provided by the EPA. This science backed standard has been in place since the beginning and is the standard used by the EPA in determining risk factors for toxic air. This standard has never been challenged, questioned or discredited and is accepted as the uniform standard used by all parties involved in air quality.

An example of this would be the chemical substance CARBON MONOXIDE, CO. The OSHA PEL is 50 ppm for an 8-hour period. OSHA standards prohibit worker exposure to more than 50 parts of gas per million parts of air averaged during an 8-hour exposure time. If the PEL for this chemical is not exceeded it is considered **SAFE** to inhale.

Not one of these chemicals in secondhand smoke gets close to their PELs for any secondhand smoke concentrations in any room in any building to be considered, implied or perceived to be a hazard to anyone inhaling it. Yes, that means **employees are not working under a hazardous workplace condition if secondhand smoke is present.**

It follows that if secondhand smoke in a building is safe to inhale under real scientific standards applied today how can it kill 60 Alaskans or 41,000 other people a year? Or another major health issue attributed to secondhand smoke exposure? Seems highly improbable that one report from OSHA could set aside everything we were told about secondhand smoke. This is why I refer to SB1 as the biggest con Alaska has experienced to date.

When an HSS committee member ask the sponsor of SB1 if smoking exceeds air quality standards in the workplace and why can't OSHA enforce this law the sponsor replied, "**he has not measured air quality as it related to smoking.**" And, "He pointed out that at the federal level there is opposition to this bill. It has been difficult to classify tobacco smoke so that state

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or federal OSHA would regulate it. He opined that tobacco smoke far exceeds many other dangerous materials."

Did I miss something here? Doesn't SB1 expound on the hazards of secondhand smoke in the air which would directly relate to the air quality being inhaled by the public who has a right to smoke-free air? But, according to the sponsor, the air quality in tobacco smoke was not researched or looked into yet it is this air that is the root for screaming all the hazards of air filled with secondhand smoke. If you didn't research the air quality in tobacco smoke how do you know that tobacco smoke far exceeds many other dangerous materials?

This state affairs committee should be looking at a state affair on the serious misrepresentation on educating the public about the **lethal** effects of exposure to secondhand smoke. **Lethal** in my pocket dictionary means **deadly, fatal.** This appears in AS Sec 44.29.020 for the Dept. of Health and Social Services to administer programs of public health to include a comprehensive smoking education, tobacco use prevention, and tobacco control program. It states the program must include (c) anti-tobacco counter-marketing targeting both youth and adult populations designed to communicate messages to help prevent youth initiation of tobacco use, promote cessation among tobacco users, **and educate the public about the lethal effects of exposure to secondband smoke.**

Really! One whiff of secondhand smoke will be fatal!

I don't believe the EPA or any recognized health institution has ever used the word **lethal** even in their misguided conceptions on risks associated with secondhand smoke. The word **lethal** in this application is not only a gross misrepresentation of the facts but it is gross negligence on the backs of those who wish to rule. This wording is used in the HSS mandated smoking education program that is handed out to the general public. I believe the creation of this unwarranted fear in the minds of the public state propaganda was more intentional than a simple oversight. It is no wonder the surveys indicate a major percentage of the population is in favor of smoking prohibition and SB1 seems to exploit this. Selling fear to the public is faster than selling facts.

Reality is that SB1 is protecting the public from the **SAFE** exposure to secondhand smoke which calls to question why we need more laws that protect the public from something that they don't need protection for.

If you must address the fear that you, the state, has, with malice, instilled in the minds of the public I suggest you come up with a law to post signs at all places where the public goes that would indicate if that facility is a smoking facility. This would allow the public to exercise their right to smoke-free air and protect themselves from the perceived risks on inhaling secondhand smoke. Proper signage would be a less restrictive means of advancing the state public health interests.

Attachment 1

State Affairs Testimony

SB1

9-Apr-15

Email from Dave Guinn, Health Consultant with Alaska Occupational, Safety & Health
Official response to a the question "What are the OSHA standards for secondhand smoke in the workplace."

Print Close

OSHA Request 39519602: Environmental Tobacco Smoke

From: **Guinn, Dave (DOL)** (dave.guinn@alaska.gov)
Sent: Fri 3/20/15 11:41 AM
To: icharrfbks@hotmail.com (icharrfbks@hotmail.com)
Cc: Markiewicz, Krystyna A (DOL) (krystyna.markiewicz@alaska.gov)

Hello Mr. Hackenmiller,

My name is Dave Guinn, I'm a Health Consultant with Alaska Occupational Safety and Health, Consultation and Training, and I've been asked to respond to your question: "What are the OSHA standards for environmental tobacco smoke, ETS, or commonly referred to as secondhand smoke, in a workplace?"

The short answer to your question is: OSHA and AKOSH (Alaska Occupational Safety and Health) currently have no occupational safety and health regulations that directly address environmental tobacco smoke (ETS) in the workplace. (See Attachment 1 below for OSHA's position on ETS in the workplace).

However, Alaska Statute AS 18.35.300, Places Where smoking Is Regulated, prohibits smoking in "a place of employment in which the owner, manager, proprietor, or other person who has control of the premises posts a sign stating that smoking is prohibited by law." The text of the Alaska statute addressing smoking can be found at: http://www.legis.state.ak.us/basis/folioproxy.asp?url=http://wwwjnu01.legis.state.ak.us/cgi-bin/folioisa.dll/stattx12/query=*/doc/%7bt8695%7d. The state agency with jurisdiction for enforcing this statute is the Alaska Department of Environmental Conservation (ADEC). In addition to state regulations, the following communities have smoke-free workplace laws:

Anchorage

Bethel

Haines

Juneau

Klawock

Nome

Palmer

Petersburg

Skagway

Unalaska

Valdez

Reference: http://dec.alaska.gov/eh/fss/Smoking_Home.html

Tobacco smoke contains many (4,700+) chemical compounds, and some of these are addressed in the OSHA Air Contaminant Standard (29 CFR 1910.1000). Examples of these and their federal and Alaska-specific occupational permissible exposure limits can be found in the table below. For additional information on the hazards of the chemicals listed below, you can use the NIOSH Pocket Guide to Chemical Hazards, which can be found at this link: http://www.cdc.gov/niosh/npg/. While ETS is unlikely to produce hazardous chemicals in concentrations high enough to violate enforceable occupational exposure standards, they remain hazardous, and tobacco smoke in combination with exposure to other hazardous substances (e.g. crystalline silica, asbestos, radon gas) increases the health hazards synergistically.

In summary:

There are no OSHA or AKOSH occupational safety and health standards that directly address ETS:

While not regulated specifically, ETS contains hazardous chemicals that may be individually regulated by OSHA and AKOSH standards;

AKOSH PELs may be lower (more protective) than federal OSHA PELs;

While present, levels of these contaminants in air resulting from ETS are unlikely to reach levels that approach or exceed OSHA/AKOSH PELs;

Alaska statutes address smoking in public places, and smoking is prohibited in places of employment that management has designated as non-smoking;

Some Alaska municipalities have smoke-free workplace laws.

Contaminant	Federal PEL [1, 2, 3]	Alaska PEL [1, 2, 3, 6]
Carbon Monoxide (CO)	50 ppm	3S ppm
Nicotine	0.5 mg/m^3	0.S mg/m^3
Benzene	1 ppm or 10 ppm [5]	1 ppm or 10 ppm [5]

Formaldehyde [4]	0.75 ppm	0.75 ppm
Methanol (wood alcohol)	200 ppm	200 ppm
Ammonia	50 ppm	35 ppm

Notes:

PEL = Permissible Exposure Limit

PPM = Parts per million (Used for contaminants in the gas phase)

Mg/m^3 = milligrams per cubic meter (Used for contaminants in the solid (particulate) phase.)

See 29 CFR 1910.1048

Benzene is covered by a specific standard (29 CFR 1910.1028), which lists a PEL of 1 ppm as an 8-hour time-weighted average. 29 CFR 1910.1028(a)(2) lists exclusions, for which the 10 ppm PEL applies.

Alaska PELs are found in Alaska Administrative Code, 8 AAC 61.1100, Table Z-1-A. Link: http://www.legis.state.ak.us/aacpdf/ak861100.pdf

This table includes only 8-hour time-weighted averages; there may be additional exposure limits such as ceilings and short-term exposure limits (STELS), as well as action levels (e.g. 0.5 ppm for benzene), which trigger other requirements for employers. As with other occupational exposure limits, these are unlikely to be triggered by ETS exposure.

If you have any additional questions, please feel free to contact AKOSH at 907-269-4940, or you can contact me directly at 907-269-4949. Thank you for your interest in occupational safety and health.

ATTACHMENT 1: OSHA Policy on Indoor Air Quality: Office Temperature/Humidity and Environmental Tobacco Smoke

February 24, 2003

MEMORANDUM FOR: REGIONAL ADMINISTRATORS STATE PLAN DESIGNEES

THROUGH: R. DAVIS LAYNE
DEPUTY ASSISTANT SECRETARY

FROM: RICHARD E. FAIRFAX, DIRECTOR
DIRECTORATE OF ENFORCEMENT PROGRAMS

SUBJECT: OSHA Policy on Indoor Air Quality: Office Temperature/Humidity and Environmental Tobacco Smoke

On December 17, 2001 OSHA withdrew its Indoor Air Quality (IAQ) proposal and terminated the rulemaking proceeding (66 FR 64946). However, the Agency still receives public inquiries about IAQ, primarily office temperature/humidity and smoking in the workplace. For that reason, we have summarized the Agency's position and guidance on these topics. We are including language in the form of letters you can utilize when responding to complainants on these topics.

Office Temperature/Humidity

As a general rule, office temperature and humidity are matters of human comfort. OSHA has no regulations specifically addressing temperature and humidity in an office setting. However, Section III, Chapter 2, Subsection V of the OSHA Technical Manual, "*Recommendations for the Employer*," provides engineering and administrative guidance to prevent or alleviate indoor air quality problems. Air treatment is defined under the engineering recommendations as, "the removal of air contaminants and/or the control of room temperature and humidity." OSHA recommends temperature control in the range of 68-76° F and humidity control in the range of 20%-60%.

As a second source of guidance, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 55, *Thermal Environmental Conditions for Human Occupancy,* addresses "thermal comfort" in an office environment, which means that an employee wearing a normal amount of clothing feels neither too cold nor too warm. This standard discusses thermal comfort within the context of air temperature, humidity, and air movement and provides recommended ranges for temperature and humidity that are intended to satisfy the majority of building occupants. These ranges vary for cold and hot weather. ASHRAE addresses ventilation and the removal of air contaminants in a separate standard, ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality.*

As you know, hazards for which OSHA does not have a specific standard are governed by Section 5(a)(1) of the Occupational Safety and Health Act (the Act; General Duty Clause) which requires that employers provide employment and a place of employment that are free from recognized hazards that are causing or are likely to cause death or serious physical harm. Citations for violations of the General Duty Clause are issued when the four components of this provision are present, and when no specific OSHA standard has been promulgated to address the recognized hazard. These four components are: 1) the employer failed to keep his/her workplace free of a "hazard"; 2) the hazard was "recognized" either by the cited employer individually or by the employer's industry generally; 3) the recognized hazard was causing or was likely to cause death or serious physical harm; and 4) there was a feasible means available that would eliminate or materially reduce the hazard.

Office temperature and humidity conditions are generally a matter of human comfort rather than hazards that could cause death or serious physical harm. OSHA cannot cite the General Duty Clause for personal discomfort.

Environmental Tobacco Smoke (ETS)

Because the organic material in tobacco doesn't burn completely, cigarette smoke contains more than 4,700 chemical compounds. Although OSHA has no regulation that addresses tobacco smoke as a whole, 29 CFR 1910.1000 *Air contaminants,* limits employee exposure to several of the main chemical components found in tobacco smoke. In normal situations, exposures would not exceed these permissible exposure limits (PELs), and, as a matter of prosecutorial discretion, OSHA will not apply the General Duty Clause to ETS.

For further information to offer to employers/employees as guidance, you may wish to review a document published by the U.S. Environmental Protection Agency (EPA) about the health effects from environmental tobacco smoke, *A Fact Sheet: Respiratory Health Effects of Passive Smoking.* Additional information on indoor air quality in general can be found on the

Indoor Air Quality Technical Links page on the OSHA website.

We hope you find this information helpful. If you have any questions, please feel free to contact the Office of Health Enforcement at (202) 693-2190

End of Attachment 1

Dave Guinn

Industrial Hygienist

Alaska OSH Consultation & Training Program

Department of Labor and Workforce Development

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http://labor.alaska.gov/lss/oshhome.htm

I work for the Alaska Department of Labor and Workforce Development, Labor Standards and Safety Division and was recently assigned your request. I must preface this response by stating that I am not an attorney; and I cannot provide legal advice. I can provide you with the current clarification of the Occupational Safety and Health Regulations that are applicable in Alaska based upon the facts provided. All requests must be in the form of letter, fax, or electronic transmission to ensure accuracy, and will be retained for future reference. Statements and conclusions expressed herein may change depending upon the inclusion or exclusion of additional facts or background information. Due to periodic changes in OSHA Standards and their interpretations, it is important for you to review them regularly.

Attachment 2

State Affairs Testimony
SB1
9-Apr-15

Letter from Larry J. "Hack" Hackenmiller dtd April 1, 2015
Subject: Real science for the hazards of secondhand smoke

From The Desk
Of
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April 1, 2015

SB1

REAL SCIENCE EXISTS
for the
HAZARDS OF SECONDHAND SMOKE

Honorable Legislators,

The U.S. Environmental Protection Agency, EPA, has done the real science on the hazards of toxic chemicals. This includes those chemicals found in secondhand smoke. In the EPA risk assessments for chemicals found in toxic air pollutants the size of the increased health risks depends on 1) the exposure level or concentration level of the pollutant and; 2) duration or length of time a person is exposed to that specified concentration level.

OSHA, the U.S. Department of Labor **O**ccupational **S**afety and **H**ealth **A**dministration establishes permissible exposure limits, **PELs,** on all EPA chemical substances known to be in contact with workers or employees in the workplace. The PEL is based on a parts per million, ppm, concentration level and an 8 hour exposure time.

A clear example of this would be the chemical substance carbon monoxide, CO. The OSHA PEL is 50 ppm for an 8-hour time period. OSHA standards prohibit worker exposure to more than 50 parts of gas per million parts of air averaged during an 8-hour time period.

The OSHA PEL standard as a health benchmark level has never been challenged as to its scientific research reliability and is a standard used by the EPA in air toxin risk assessments.

The EPA classifies smoke coming from the butt of a cigarette, cigar or pipe or exhaled by a smoker as "Environmental Tobacco Smoke", ETS, and is sometimes called involuntary or passive smoking. Hereafter ETS will be called secondhand smoke to eliminate confusion.

OSHA has established PELs for all the measurable chemicals in secondhand smoke, including the 40 alleged carcinogens in secondhand smoke. According to OSHA **no harm will result from an 8-hour workday exposure to secondhand smoke.**

As for secondhand smoke in the air at a workplace, OSHA has stated outright that "Field studies of environmental tobacco smoke indicate that under normal conditions the **components** in tobacco smoke **are diluted below** existing Permissible Exposure Limits as referenced in the Air

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Contaminant Standard (29 CFR 1910.1000)....**it would be very rare to find a workplace with so much smoking that any PEL would be exceeded."**

(Bold letters added for emphasis)

(Letter from Greg Watchman, Acting Sec'y. OSHA, to Leroy J. Pletten, PHD, July 8, 1997)

The **data source.** Taking the figures for chemicals found in secondhand smoke from the EPA an independent Public Health Policy Research group, Littlewood & Fennel calculated the number of cigarettes that would be required to reach the **lowest publisbed "danger" threshold for each of the measurable chemical emissions found in secondhand smoke.**

The researchers posit a sealed, unventilated enclosure that is 20 feet square with a 9 foot ceiling clearance for all chemical measurements.

Based on the standard 8 hour workday exposure to toxic chemicals in a 20 square foot enclosed room some notable examples of their results are shown.

Chemical **BENZO(a)PYRENE**

222,000 cigarettes would be required to reach the EPA "lowest" published danger threshold.

Chemical **ACETONE**

118,000 cigarettes would be required to reach the EPA "lowest" published danger threshold.

Chemical **TOLUENE**

50,000 PACKS of simultaneously smoldering cigarettes.

Chemical **ACETALDEHYDE or HYDRAZINE**

More than 14,000 smokers would have to light up simultaneously in the little room to reach the EPA threshold at which they might begin to pose a danger.

OSHA and the Alaska authority on workplace safety, **AKOSH**, Alaska Occupational Safety and Health, have no occupational safety and health regulations that directly address secondhand smoke. They both use the standard PELs for chemical substances. In the absence of any occupational and health standards for secondhand smoke both authorities are governed by the Occupational Safety and Health Act, (the act: General Duty Clause) which requires that employers provide employment and a place of employment that are free from **recognized hazards that are causing or are likely to cause death or serious physical harm.**

Note the mandate for the General Duty Clause to be used where no other method exists the word **HAZARD** finds definition in itself - "causing or likely to cause death or serious physical harm."

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Based on real science, common sense and reality prove secondhand smoke in the workplace is **NOT A HAZARDOUS WORK CONDITION** under the Occupational Safety and Health Act which requires that employers provide employment at a place of employment that are free from recognized hazards that are free from recogmized hazards that are causing or likely to cause death or serious physical harm.

SCIENCE vs. PROPAGANDA

LUNG CANCER

In 1989 the EPA was charged with further evaluating the evidence of health effects of secondhand smoke.

In 1992 EPA published its report, "Respiratory Health Effects of Passive Smoking." Claiming secondhand smoke is a serious public health problem, that it kills approximately 3,000 nonsmoking Americans each year from lung cancer and that it is a Group A carcinogen (like Benzene, asbestos, and radon).

For this 1992 report EPA arbitrarily chose to equate secondhand smoke with mainstream (or firsthand) smoke. One of the agency's stated assumptions was that because there is an association between active smoking and lung cancer there also must be a similar association between secondhand smoke and lung cancer.

Thrown out. In November 1995 after a 20-month study, the Congressional Research Service released a detailed analysis of the EPA report that was highly critical of EPA's methods and conclusions. In 1998, in a devastating 92-page opinion Federal Judge William Osteen **vacated the EPA study, declaring it null and void.** He found a culture of arrogance, deception and cover-up at the agency.

Damage done. This thrown out null and void 1992 study was still cited by Surgeon General Richard Carmona 2006 report on secondhand smoke which made an absurd claim that there is no risk-free level of exposure to secondhand smoke. A false manifestation held as fact by the tobacco-control movement and government agencies, including our Alaska Health and Social Services Division, to justify the imposition of thousands of indoor smoking bans in public places.

More real science. In 2003 a definitive paper on secondhand smoke and lung cancer mortality was published in the British Medical Journal. It is the largest and most detailed study ever reported (up to 2010). The authors studied more than 35,000 never-smokers over a 39 year period and found no statistically significant association between exposure to secondhand smoke and lung cancer mortality.

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CONCLUSION.
You would be scientifically correct to assume secondhand smoke and lung cancer have little if nothing to do with each other. You would he politically correct to assume otherwise.

Statistics on secondhand smoke deaths, heart problems, SIDS, etc. all become discredited based on real science concerning permissible exposure limits for inhaling toxic chemical substances in a building. No science knows what causes Sudden Infant Death Syndrome, SIDS, or Asthma yet EPA pages state secondhand smoke as a cause. These children health issues are associated with home air toxins and not the incidental exposure of air toxins outside the home. An eighth month old child is not going to die from exposure to secondhand smoke from a restaurant or other public place. Any reference to protecting children by enacting secondhand smoke laws for public places is a stretch of reality if not a joke! And a home is not a public place.

If the state of Alaska wanted to restrict fact or fiction secondhand smoking restrictions in their buildings or holdings no legislation is required. The governor may restrict smoking in all state properties by executive authority as the administrator of the state's holdings.

The same is true for any property owner. The owner has a right to control or restrict smoking on their properties and has remedy such as trespassing laws to enforce their right. Hospitals and most restaurants are good examples of exercising these constitutional rights.

But the same constitutional right holds true for property owners to allow tobacco smoking in their facilities when no public health issue from hazardous working condition exists with the presence of secondhand smoke. A frequently used theory that the public has a right to smoke-free air ends on entering a private business that is open to the public and now becomes a choice under the rights and control of the owner. The right to smoke-free air does not lessen or eliminate the right to smoke-filled air. The smoke filled air coming from a forest fire violates what constitution right affixed to the right of secondhand smoke free air?

The city of Fairbanks does have health powers but voted not to pass a no-smoking ordinance in 2009. The city council determined from testimony given by anti-smokers that 85% of the restaurants in Fairbanks were non-smoking and there was no need to restrict smokers in 15% of the restaurants that still allowed smoking. (2015 less than 5% of the restaurants are non-smoking by choice) The credibility of the testimony that 50,000 people a year die from secondhand smoke was also a factor in the outcome of the city council vote citing no data in Fairbanks of any secondhand smoke deaths, or at least a death certificate listing secondhand smoke as the cause of death. My thoughts on this was that the city council was concerned about the Fairbanks air and not the air in California or anywhere else in the U.S.A. Just my observations from attending the meeting.

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LOCAL OPTION

SB1 does not allow for local option for cities, boroughs or unorganized villages to regulate smoking in their respective communities. Local option exists for alcohol and pending legislation on marijuana but nothing in SB1. One thought is that a small business in a small local community might find remedy in a legal action to discard state no-smoking restrictions arguing no real or proven health risk or hazard to the public health exists.

SOLUTION

We have grown so accustomed to testimonials from smoking prohibitionists and misguided health officials, to include the EPA and our own Alaska Health & Social Services Division, on the perceived dangers of secondhand tobacco smoke that we accept these manifestations as an article of faith even though scientific standards in place today prove otherwise.

Recognizing that a majority of voting Alaskans fear secondhand smoke more than they fear God their misguided beliefs do need some recognition and response from government to address their concerns.*(Testimony – 82% of Alaskans survey want secondhand smoke laws – church attendance not that high!)*

For those who believe that being exposed to secondhand smoke is a health issue they should be given proper notice of a possible health issue where secondhand smoke may exist. The choice to put themselves in harm's way by exposing themselves to secondhand smoke would belong to them. We already do this by using public broadcasts to inform the public of health risks associated with forest fire smoke and particulate matter.

SB1 should be amended by deleting every section and add a new section that mandates all buildings in the state of Alaska that are open to the public post a sign at or near the entrance to that building that reads this building or identified portions of this building is a smoking facility or this building is a tobacco free facility – or wording to that effect.

This signage is applicable to taxi cabs or other vehicles involved in public transport and does not restrict those communities who already have no-smoking laws in place but will be required to post signs with appropriate language if their no-smoking laws do not have such notification signage.

You don't need a complicated fine system for those who don't have signs posted but you do need someone from Health & Social Services to provide and put up a sign when needed to protect the public from seeing or coming in contact with bad health practices. Because that is what Health & Social Services is supposed to do - keep the public informed of all health issues, perceived or real, hazardous or not? Fiscal note – pay for the signs.

Larry J. "Hack" Hackenmiller
Registered Voter Extraordinaire

Daniel George

From: chase griffith <lastat81@gmail.com>
Sent: Tuesday, April 14, 2015 2:15 PM
To: Sen. Bill Sto tze
Subject: Please Oppose SB 1 and HB 40 and any other effort to treat e-cigarettes ike smoking.

chase griffith
54200 Leonard dr
kenai, AK 99611

April 14, 2015

Dear Bill Stoltze,

I am writing to express my deep concern and opposition regarding HB 40 and SB 1 which would include the use of smoke-free vapor products (e-cigarettes) in Alaska's smoking law.

Smoking laws are ostensibly enacted to protect the public from the harm of secondhand smoke, but smoke-free e-cigarettes have not been shown to cause harm to bystanders. In fact, all evidence to date shows that the low health risks associated with e-cigarettes are comparable to other smokeless nicotine products. A comprehensive review conducted by Dr. Igor Burstyn of Drexel University School of Public Health (and published in a peer-reviewed journal earlier this year - http://www.biomedcentral.com/1471-2458/14/18/abstract) examined over 9,000 observations of e-cigarette liquid and vapor and found "no apparent concern" for bystanders exposed to e-cigarette vapor, even under "worst case" assumptions about exposure.

Lawmakers must beware of unintended consequences from well-intentioned laws. There is clear evidence of a phenomenon called "accidental quitting," wherein many of the smokers who initially choose e-cigarettes to use just where smoking is prohibited go on to quit smoking conventional cigarettes completely. Prohibiting the use of e-cigarettes in public spaces completely eliminates that incentive to even try e-cigarettes. Unfortunately, the health risks of every one smoker who doesn't quit because e-cigarette use is prohibited (and the risks to the children and others who live with them) cummulatively outweigh any good done by eliminating the miniscule exposures to even hundreds of bystanders in public spaces.

Clearly, the benefits of allowing smokers to use e-cigarettes in public--and thereby increasing the likelihood of "accidental quitting" and reducing the known, extremely high health risks of smoking--outweigh the very low risks of insignificant exposures to bystanders. So, not only is there no genuine public health reason to prohibit e-cigarette use in public spaces, but, in fact, allowing e-cigarettes to be used in public spaces will actually improve public health by inspiring other smokers to switch and reduce their health risks by an estimated 99%. Moreover, private businesses in Alaska are already setting their own policies, and they should retain the right to allow or disallow usage since there is no proven health threat to bystanders.

While I understand some have expressed a fear about these products acting as a "gateway" to traditional cigarettes for youth, there is no evidence to suggest this is really happening, and research actually shows it is unlikely to happen to any substantial extent. Teen smoking rates are at their lowest point since smoking became popular and continue to drop, but there are adults who will continue to smoke until they die unless we provide attractive alternatives.

I urge you to oppose these bills and any legislation that would limit where smoke-free products like e-cigarettes can be used. It is imperative that existing adult smokers become aware of all the alternatives currently available and that access to these products remains unimpeded.

I look forward to your response on this issue. I, along with my fellow members of CASAA (Consumer Advocates for Smoke-free Alternatives Association), thank you for considering my comments and hope you will oppose misguided attempts to limit adult use of smoke-free e-cigarettes.

Sincerely,
chase griffith

Daniel George

From: Jane Schneider <jschneider@aktriallaw.com>
Sent: Tuesday, April 14, 2015 1:05 PM
To: Sen. Bill Sto tze
Subject: Please Oppose SB 1 and HB 40 and any other effort to treat e-cigarettes ike smoking.

Jane Schneider
18040 Spain Drive
Anchorage, AK 99516

April 14, 2015

Dear Bill Stoltze,

I quit smoking using e-cigs. I had smoked for over 35 years. E-cigs are helping smokers across the Nation kick the tobacco habit. I use my e-cigarette in the car with the windows closed and my husband cannot smell the vapor. E-cigs are benign and should not be banned as a dangerous substance. Treating e-cigs like cigarettes is knee-jerk, uninformed reaction.

I am writing to express my deep concern and opposition regarding HB 40 and SB 1 which would include the use of smoke-free vapor products (e-cigarettes) in Alaska's smoking law.

Smoking laws are ostensibly enacted to protect the public from the harm of secondhand smoke, but smoke-free e-cigarettes have not been shown to cause harm to bystanders. In fact, all evidence to date shows that the low health risks associated with e-cigarettes are comparable to other smokeless nicotine products. A comprehensive review conducted by Dr. Igor Burstyn of Drexel University School of Public Health (and published in a peer-reviewed journal earlier this year - http://www.biomedcentral.com/1471-2458/14/18/abstract) examined over 9,000 observations of e-cigarette liquid and vapor and found "no apparent concern" for bystanders exposed to e-cigarette vapor, even under "worst case" assumptions about exposure.

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Sincerely,
Jane Schneider

Daniel George

From: Pamela Bush <perrennial@gci.net>
Sent: Tuesday, April 14, 2015 2:55 PM
To: Sen. Bill Sto tze
Subject: Please Oppose SB 1 and HB 40 and any other effort to treat e-cigarettes ike smoking.

Pamela Bush
919 1/2 E 9th Ave
Anchorage, AK 99501

April 14, 2015

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Smoking laws are ostensibly enacted to protect the public from the harm of secondhand smoke, but smoke-free e-cigarettes have not been shown to cause harm to bystanders. In fact, all evidence to date shows that the low health risks associated with e-cigarettes are comparable to other smokeless nicotine products. A comprehensive review conducted by Dr. Igor Burstyn of Drexel University School of Public Health (and published in a peer-reviewed journal earlier this year - http://www.biomedcentral.com/1471-2458/14/18/abstract) examined over 9,000 observations of e-cigarette liquid and vapor and found "no apparent concern" for bystanders exposed to e-cigarette vapor, even under "worst case" assumptions about exposure.

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Sincerely,
Pamela Bush

SB1 testimony

My name is Sheb Garfield, I am a ex smoker, now an avid vaper, and manager at Cafe De Vapor.

SB1 includes personal vaporizers because of the fear of second hand vapor being as dangerous as second hand smoke, and its supporters tout that there isn't very much research on this subject so we should preemptively ban their use in public places and businesses . A short time on Google will show you the opposite, once you weed through the Blogs and articles hyping the evils of vaping that state opinion instead of facts, by cherry-picking certain results out of context, or using correlation as proof instead of causation. The biggest offenders being Americans for nonsmokers rights ie. Stanton Glantz's pseudoscience front, and most recently the california debacle called SmokeFree CA.

here are some recent studies showing that second hand vapor is risk free,
a peer reviewed study in toxicology and pharmacology published dec of 2014 compared the makeup of second hand smoke, and secondhand vapor to ambient air, ive included a copy of the study and the peer review with my testimony because there isn't enough time today to go over it all but here are some highlights.

- The e-cigarettes contained and delivered mostly glycerin and/or PG and water.
- Aerosol nicotine content was 85% lower than the cigarette smoke nicotine.
- The levels of harmful or potentially harmful chemicals in aerosol were consistent with the air blanks (<2 micrograms/puff).
- Mainstream cigarette smoke HPHCs (3000 micrograms/puff) were 1500 times higher than e-cigarette HPHCs.
- No significant contribution of tested HPHC classes was found for the e-cigarettes.

the only difference this study found between ambient air and the vapor in a ecig was more VG, PG, and higher weter content, everything else was consistent with the air we are already breathing in, let me say that again in case someone missed it. everything else was consistent with the air we are already breathing in.

Now lets take a look at some health experts that support vaping:

Dr Murrey Laughesen New Zealands most respected tobacco policy and health researcher

. nicotine is one of the safest of drugs, and is being sold as the alternative to the most dangerous consumer product the tobacco cigarette Low risk compared to cigarettes is the real world risk that smokers face"

I chose this statement because the supporters of this bill including the Alaska Tobacco Control Alliance and Alaska Dept of Health keep claiming nicotine is as harmful and addictive as heroin always talk about its addictive qualities, and dangerous health concerns which brings me to the next quote, Dr. Jean-François Etter (PhD, MPH), Professor at University of Geneva

'Even if there are long-term vapers, this is not a problem, as long as they quit smoking. The problem is combusted tobacco, not nicotine At the dosage used by vapers or users of nicotine gums or patches nicotine is not toxic Long term vaping is not a public health problem not any more than long term use of nicotine gums "

comparison of e-cig aerosol to ambient air

peer review

http://www.sciencedirect.com/science/article/pii/S0273230014002505

download actual study

http://www.sciencedirect.com/science/article/pii/S0273230014002505/pdfft?md5=5f4aee56cba57fa54653d223da192939&pid=1-s2.0-S0273230014002505-main.pdf

Health experts on Vaping
this article cites the studies and interviews where the quotes were pulled from, as well as many other resources that show the lack of risk to second hand vapor and the benefits of vaping
http://vapers.org.uk/10-health-experts-who-endorse-e-cigarettes/

Contents lists available at

Regulatory Toxicology and Pharmacology

journal homepage: www.elsevier.com/locate/yrtph

Comparison of select analytes in aerosol from e-cigarettes with smoke from conventional cigarettes and with ambient air

Rana Tayyarah , Gerald A Long

Lorillard Tobacco Company, PO Box 21688, Greensboro, NC, USA

ARTICLE INFO

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Keywords:
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Harmful and potentially harmful constituents (HPHC)

ABSTRACT

Leading commercial electronic cigarettes were tested to determine bulk composition. The e-cigarettes and conventional cigarettes were evaluated using machine-puffing to compare nicotine delivery and relative yields of chemical constituents. The e-liquids tested were found to contain humectants, glycerin and/or propylene glycol, (≥75% content); water (<20%); nicotine (approximately 2%); and flavor (<10%). The aerosol collected mass (ACM) of the e-cigarette samples was similar in composition to the e-liquids. Aerosol nicotine for the e-cigarette samples was 85% lower than nicotine yield for the conventional cigarettes. Analysis of the smoke from conventional cigarettes showed that the mainstream cigarette smoke delivered approximately 1500 times more harmful and potentially harmful constituents (HPHCs) tested when compared to e-cigarette aerosol or to puffing room air. The deliveries of HPHCs tested for these e-cigarette products were similar to the study air blanks rather than to deliveries from conventional cigarettes; no significant contribution of cigarette smoke HPHCs from any of the compound classes tested was found for the e-cigarettes. Thus, the results of this study support previous researchers' discussion of e-cigarette products' potential for reduced exposure compared to cigarette smoke.

1. Introduction

Electronic cigarettes (e-cigarettes) are a relatively new consumer product. Unlike conventional cigarettes, e-cigarettes do not burn tobacco to deliver flavor. Instead, they contain a liquid-based flavorant (typically referred to as e-liquid or e-juice) that is thermally vaporized by an electric element. This liquid typically consists of a mixture of water, glycerin, and/or propylene glycol. The liquid also contains nicotine and flavor, although nicotine-free products are available.

While there are decades of characterization studies and numerous standardized analytical procedures for conventional cigarettes, relatively little published analytical data exists for commercial e-cigarette products. Furthermore, no standardized test methods or reference products exist for e-cigarettes.

Electronic cigarettes are generally purported to provide reduced exposure to conventional cigarettes' chemical constituents because they deliver flavors and nicotine through vaporization rather than by burning tobacco. Goniewicz et al. (2014) reported low levels of select chemical constituents in select e-cigarette brands commercially available in Poland. A recent review of analyses from diverse e-cigarettes shows comparatively simple chemical composition relative to conventional cigarette smoke (Burstyn, 2014). However, limited published results exist for commercial products that represent a significant presence in the marketplace (Cheng, 2014).

The purpose of this study was to evaluate e-cigarette products with a significant presence in the marketplace for bulk composition, including nicotine, and for select constituents for comparison with conventional cigarette products. Three blu eCigs products (approximately 50% of the US market) and two SKYCIG products (approximately 30% of the UK market) were chosen for evaluation. Marlboro Gold Box (US), and Lambert & Butler Original and Menthol products (UK), with significant market share in their respective geographical areas, were included in the study for conventional cigarette comparisons.

Abbreviations: ACM, aerosol collected mass; HPHC, harmful and potentially harmful constituents; CO, carbon monoxide; TSNA, tobacco-specific nitrosamines; PAA, polyaromatic amines; PAH, polyaromatic hydrocarbons; LOQ, limit of quantitation; LOD, limit of detection; CAN, Health Canada Test Method T-115; blu CTD, Classic Tobacco Disposable; blu MMD, Magnificent Menthol Disposable; blu CCH, Cherry Crush, Premium, High Strength; SKYCIG CTB, Classic Tobacco Bold; SKYCIG CMB, Crown Menthol Bold; MGB, Marlboro Gold Box; L&B O, Lambert & Butler Original; L&B M, Lambert & Butler Menthol; TPM, total particulate matter; PG, propylene glycol.

* Corresponding author. Fax: +1 336 335 6640.
E-mail address: (R. Tayyarah).

0273-2300/

The products used in the study were evaluated for content and delivery of major ingredients (glycerin, propylene glycol, water, and nicotine) and for select constituents (carbon monoxide (CO), carbonyls, phenolics, volatile organic compounds (volatiles), metals, tobacco-specific nitrosamines (TSNAs), polyaromatic amines (PAAs), and polyaromatic hydrocarbons (PAHs)). Many of these constituents are included in cigarette industry guidance issued by the FDA that includes reporting obligations for harmful and potentially harmful constituents (HPHCs) in cigarette filler and smoke under section 904(a)(3) of the 2009 Family Smoking Prevention and Tobacco Control Act ( ). For delivery studies, the conventional cigarettes were smoked under an intense puffing regime published by . The e-cigarettes were tested using minimal modifications to this smoking regime. Ninety-nine puffs were used to collect approximately the same aerosol mass as obtained from conventional cigarette testing. Ambient 'air' samples, empty port collections, were included as a negative control of aerosol testing for cigarette constituents (i.e. HPHC).

2. Materials and methods

2.1. Test products

Two disposable e-cigarette products and three rechargeable e-cigarette products were obtained from the manufacturers. Three conventional cigarette products were purchased through wholesale or retail sources for testing. Information for each of the products is listed in Table 1.

2.2. Methods overview

ISO 17025 accredited analytical methods were used to evaluate the cigarette samples for select HPHCs in mainstream smoke. Official methods are cited and other, internally validated, methods are briefly described for general understanding. Furthermore, because no standardized methods exist for e-cigarette analysis, the methods used to evaluate the conventional cigarettes were adapted to evaluate the e-cigarette products and the study blanks (room air). In an effort to maximize signal and lower methods' limits of quantitation, aerosol collection amounts were maximized (but maintained below breakthrough) and extraction solvent volumes were minimized. In some cases, alternative instrumentation was employed to improve detection. For example, mainstream smoke TSNAs were analyzed by GC–TEA while aerosol and air blank samples were analyzed by LC–MS/MS. Accuracy, precision, and method limits of quantitation and detection (LOQ and LOD) were verified for each method. On average, accuracy and method variability for the analytes tested were determined to be 98% and 3%, respectively. Analyte LOD and LOQ information is listed in Supplemental Appendix A Tables 1 and 2. Method resolution for low levels of analytes was influenced by background levels of select analytes in air control samples. These background levels are attributed to instrument or smoking machine carry-over as evidenced in solvent or air blanks. In addition, the high concentration of glycerin and water in e-cigarette aerosol present challenges for volatile-based measurement systems (i.e. GC). Additional method refinements and dedicated e-cigarette puffing machines are two areas for consideration to improve e-cigarette aerosol method sensitivities. Method development and verification details for e-cigarette liquids and aerosols are the subject of a future publication

2.3. Smoke and aerosol collection

Cigarette preparation and machine smoking for conventional cigarettes are described in Health Canada Test Method T-115 (CAN) (1999) Two to three cigarettes were smoked per replicate for conventional cigarettes and 99 puffs were taken from single e-cigarettes for no more than approximately 200 mg of particulates collected per pad. Three to five replicates were tested for each measurement. Prior to analysis, filter pads from cigarette smoke collection were visually inspected for overloading of particulates, as evidenced by brown spotting on the back of the filter pad. To ensure no overloading of particulates for aerosol collection, e-cigarette units were weighed before and after collection to verify that product weight change and filter pad weight change were comparable. Air blanks were prepared by puffing room air (99 puffs) through an empty smoking machine port to the indicated trapping media for an analysis method. These air blank samples were prepared and analyzed in the same manner and at the same time as the e-cigarette aerosol samples. Smoke and aerosol collection sections were conducted separately. Smoke and aerosol particulate was collected onto 44 mm glass fiber filter pads with >99% particulate trapping efficiency for each replicate analysis. For carbonyls, smoke/aerosol was collected directly by two impingers, in series. For smoke metals analysis, electrostatic precipitation was used. For volatiles and PAH determinations, single chilled impingers were placed in-line with the filter pads. e-Liquid glycerin and nicotine were quantitated using GC–FID and/or GC–MS using a method equivalent to ISO 10315 (ISO, 2000a). e-Liquid water was quantitated using Karl Fischer analysis. A reference e-liquid was developed and used as a testing monitor for ingredient determinations in the e-liquid samples. The reference e-liquid is composed primarily of glycerin, propylene glycol, and water with low levels of nicotine, menthol, and Tween 80. The Tween 80 is added to improve solubility of menthol in the solution. The reference is not meant to directly mimic an e-liquid used for consumption but merely used for analytical control charts. Three replicates were tested for each sample and the reference.

2.4. Analytical assays

Carbon monoxide was determined concurrently with aerosol and smoke collection for nicotine and water and analyzed by NDIR using ISO method 8454:2007 (ISO, 2007). Carbonyls were trapped using 2,4-dinitrophenylhydrazine as a derivatizing agent with

Table 1
List of cigarette and e-cigarette products tested.

Product	Manufacturer	Product type	Nicotine information provided on packaging
Classic Tobacco Disposable (blu CTD)	blu eCigs	Disposable e-cigarette	Content: 24 mg/unit
Magnificent Menthol Disposable (blu MMD)	blu eCigs	Disposable e-cigarette	Content: 24 mg/unit
Cherry Crush, Premium, High Strength (blu CCH)	blu eCigs	Rechargeable e-cigarette	Content: 16 mg/unit
Classic Tobacco Bold (SKYCIG CTB)	SKYCIG	Rechargeable e-cigarette	Content: 18 mg/unit
Crown Menthol Bold (SKYCIG CMB)	SKYCIG	Rechargeable e-cigarette	Content: 18 mg/unit
Marlboro Gold Box (MGB)	Philip Morris USA	Conventional cigarette	–
Lambert & Butler Original (L&B O)	Imperial Tobacco	Conventional cigarette	Yield: 0.9 mg/cig (ISO)
Lambert & Butler Menthol (L&B M)	Imperial Tobacco	Conventional cigarette	Yield: 0.5 mg/cig (ISO)

subsequent analysis by UPLC–UV using CORESTA method 74 ( ). For phenolics determination, filter pads were extracted with 20 mL of 1% acetic acid/2.5% methanol (MEOH) in water using 30 min of agitation. Extracts were analyzed by UPLC-fluorescence detection using a C18 column for separation. For volatiles analysis, filter pads and impinger solutions (20 mL MEOH) were combined. Extracts were analyzed by GC–MS in SIM mode using a WAX capillary column. For metals analysis, cigarette smoke was collected using an electrostatic precipitator while e-cigarette aerosol was collected on glass fiber filter pads. After smoking, the cigarette smoke condensate was rinsed from the electrostatic precipitation tube using methanol. The dried condensates were digested using hydrochloric (10% v/v), nitric acids (80% v/v), and heat and were diluted prior to analysis by ICP-MS. For aerosol samples, filter pads were extracted using 20 mL of a mixture of nitric (2% v/v) and hydrochloric acids (0.5% v/v) using wrist action shaker (20 min). Resultant extracts were analyzed by ICP-MS equipped with an octapole reaction cell.

For TSNA analysis of smoke, samples were extracted in nonpolar solvent, treated to an SPE clean-up, concentrated and analyzed by GC–TEA following CORESTA method 63 (CORESTA, 2005). For TSNA analysis of aerosol samples, filter pads were extracted with 20 mL of 5 mM aqueous ammonium with 15 min of shaking. Extracts were analyzed by LC–MS/MS with a C18 column. For PAA determinations, filter pads were extracted using 25 mL of 5% HCl (aq) and shaking (30 min) followed by solvent exchange and derivatization with pentafluoropropionic acid anhydride and trimethylamine. After an SPE clean-up step (Florisil® SEP-PAK), samples were analyzed by GC–MS in SIM mode using negative chemical ionization. PAH analysis was conducted by extraction in MEOH followed by SPE clean-up and analysis by GC–MS in SIM mode (Tarrant et al., 2009).

The results obtained from these analyses were tabulated as mean ± one standard deviation for levels of selected compounds in Supplementary Appendix A. In cases where quantifiable amounts of analyte were present in an e-cigarette aerosol sample above that of the associated air blanks, an Analysis of Variance (ANOVA) was used to compare the means for the cigarette smoke data with respective aerosol data. Statistical analyses were performed using JMP 10.0.0 (SAS Institute, Inc. Cary, NC, USA). The significance level was established as $p < 0.05$ for all comparisons.

3. Results and discussion

3.1. Collection of aerosol

Machine smoking of cigarettes under standardized regimes is for comparative purposes and is not intended to represent the range of consumer smoking behaviors. Thus, standardized equipment, cigarette reference products, and methodology have been established to allow comparison of different products under a common set of controlled conditions. ISO 3308:2000E and Health Canada (CAN) methods are frequently used for standardized smoking of conventional cigarettes for the purposes of laboratory comparisons among products ( ). Following each of these methods, conventional cigarettes are smoked to a specified butt length using a fixed and specified puffing volume, duration, and interval.

Regarding e-cigarette experimentation, there is no generally accepted standard e-cigarette puffing regime at this time. Topography studies are limited but anecdotal information indicates e-cigarette usage depends greatly on the individual consumer and product design and capabilities. For the purposes of this study, our objective was to collect sufficient aerosol to be able to detect, if present, select HPHCs. A wide range of parameters would be adequate to accomplish this. Given the objectives of this study, use of collection parameters which are compatible with conventional and electronic cigarettes was essential for facilitating comparisons between cigarette smoke and e-cigarette aerosol. The more intense of the standard regimes used with cigarettes, CAN, which requires 55 mL puffs taken twice a minute, was adapted for this investigation. The key difference required for testing e-cigarettes with the CAN method is that a fixed puff count (rather than 'butt length') is necessary for aerosol collection. A standard of 99 puffs was adopted for all e-cigarette and air blank analyses. This puff count provides similar total particulate collection per pad between the e-cigarette samples and the conventional cigarette testing. This also represents approximately 11 times more puffs than are typically observed for a conventional cigarette. Marlboro Gold Box, L&B O, and L&B M averaged 9.1, 8.2, and 7.2 puffs per cigarette, respectively, when machine-smoked to the standard butt length. If more aggressive puffing parameters had been chosen for the study, the puff count specification would have been lowered to maintain the target level of ACM collected. Note that the range of puffs collected in-use may vary widely depending on product design, battery strength, and user puffing preferences. Thus, the 99 puffs collection in this study is not intended to represent a life time use yield for any of the analytes tested.

3.2. Aerosol and smoke characterization – reference information

Traditional cigarette testing incorporates the use of monitor or reference cigarettes that serve as positive controls and provide quality metrics for standardized analytical methods. Key examples are Kentucky Reference cigarettes and CORESTA monitor cigarettes (CORESTA, 2009; ISO, 2003; University of Kentucky, 2014). Each of

Table 2
Percent composition of e-liquid and aerosol.

	Glycerin (%)	Propylene glycol (%)	Water (%)	Nicotine (%)	Flavor (%)
e-Liquid composition					
blu Classic Tobacco Disposable	82	–	9	2	7
blu Magnificent Menthol Disposable	75	–	18	2	5
blu Cherry Crush High Premium	77	–	14	2	7
SKYCIG Classic Tobacco Bold	24	67	6	2	1
SKYCIG Crown Menthol Bold	21	66	7	2	4
e-Cigarette aerosol composition					
blu Classic Tobacco Disposable	73	–	15	1	11
blu Magnificent Menthol Disposable	80	–	18	2	–
blu Cherry Crush High Premium	70	–	19	1	10
SKYCIG Classic Tobacco Bold	24	61	10.4	1.6	3
SKYCIG Crown Menthol Bold	21	59	12	2	6

[a] Flavor content is estimated by difference.
[b] Aerosol % composition calculated based on the ACM delivery as analyte yield (mg)/ACM (mg) × 100.

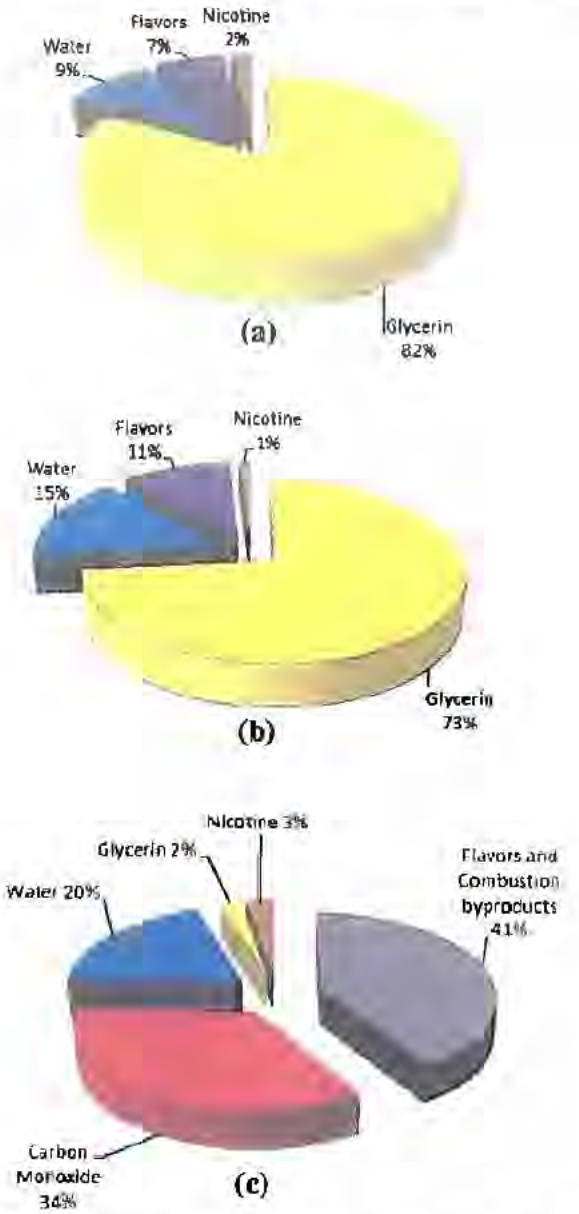

Fig. 1. Percent composition comparison for e-liquid, e-cigarette aerosol, and cigarette smoke: (a) Classic Tobacco Disposable e-liquid Composition. (b) Classic Tobacco Disposable Aerosol Composition (99 puffs, CAN). (c) Marlboro Gold Box Smoke Composition (9 puffs, CAN).

these reference cigarettes can serve as a single positive control and an indicator of method variability within and among laboratories for all analytes of interest. The manufacture, design, and function of these reference products are similar to those of commercial cigarettes. Currently reference products are not available for e-cigarette testing. Given the range of e-cigarette designs, development of a consensus strategy to produce positive controls or monitors for e-cigarette testing is needed.

In the absence of standardized e-cigarette references, measures were taken to ensure experimental robustness. For example, aerosol collected mass (ACM) results for the e-cigarette samples were compared across methods as an indicator of puffing consistency for a given product among the machine-puffing sessions required to conduct the battery of tests. Thus, if a sample set yielded ACM outside of a specified ranged deemed typical for a given product, the sample set was repeated. This range was determined for each product based on collection of 20 or more replicates across the product lot using CAN parameters.

Also, because results from initial analyses indicated low or no measurable levels of many of the analytes, blank samples were included to verify any contribution of analyte from the laboratory environment, sample preparation, and/or analyses for each HPHC test method. The air blank results are listed with the samples' results in Tables 4 and 5. There were instances for which solvent blank and air blank samples had measurable levels of an analyte. This is due to the ubiquitous nature of some of the analytes, such as formaldehyde, or to carry-over. Laugesen reported similar findings (2009). These observations serve as a cautionary note regarding the measurement of extremely low levels of constituents with highly sensitive instrumentation.

3.3. Main ingredients

e-Liquid expressed from the individual products was tested for reported e-cigarette ingredients to compare the percent compositions of the e-liquids and the aerosols. Percent composition calculations of the ingredients are shown in Table 2 for each sample and in Fig. 1 for blu CTD, as this product's comparative results were exemplary of the samples. The primary ingredients in the e-cigarette samples were glycerin and/or propylene glycol (≥75%). Water (≤18%) and nicotine (~2%) were also present. Based on a mass balance, other ingredients, presumed to be flavorants, were present at less than 7%. Note that this calculation would also include method uncertainty and any possible HPHCs, if present. The composition of the aerosol was calculated based on the ACM delivery as analyte yield (mg)/ACM (mg) × 100. The bulk composition of the delivered aerosol was similar to the bulk composition of the e-liquid.

By comparison, the total particulate matter (TPM) of the conventional cigarettes tested is 30% water and <5% nicotine. The essential difference between the ACM composition of the e-cigarettes tested and the TPM of the conventional cigarettes is that the remaining 65% of the TPM of the conventional cigarette is predominantly combustion byproducts. There was no detectable carbon monoxide in the emitted aerosol of the e-cigarette samples. The conventional cigarettes, on the other hand, delivered more than 20 mg/cig of CO. Smoke composition for Marlboro Gold Box, exemplary of the conventional cigarettes tested, is shown in Fig. 1 in contrast to the e-liquid and aerosol results for blu CTD.

While the percent composition of the nicotine in the ACM and TPM are relatively similar, it should be noted that the actual deliveries of nicotine are markedly lower for the e-cigarettes tested than the conventional cigarettes. The nicotine yields ranged from 8 μg/puff to 33 μg/puff for the e-cigarette samples which was 85% lower than the 194–232 μg/puff for the conventional cigarettes. These results are presented in Table 3.

3.4. Aerosol and smoke HPHC testing

For cigarette smoke analysis, the conventional cigarettes were machine smoked by established cigarette smoking procedures. Approximately 7–9 puffs per cigarette were collected. For the e-cigarette samples and air blanks, 99 puffs were collected. Results were compared on an 'as tested' basis; i.e. yields for a single cigarette of 7–9 puffs compared to yields from 99 puffs of an e-cigarette as displayed in Table 4. Additionally, in order to simplify making comparisons between the cigarette and e-cigarette samples, all values were converted to yield per puff. These results are summarized by class in Table 5. Results for individual analytes are tabulated as mean ± one standard deviation in Supplemental Appendix A Tables 1 and 2.

Table 3
Nicotine content and yield comparison between e-cigarettes and conventional cigarettes (mean ± standard deviation).

	Nicotine content (μg/unit)	Nicotine yield (μg/puff)
blu Classic Tobacco Disposable	20,600 ± 1500	33 ± 12
blu Magnificent Menthol Disposable	20,000 ± 300	25 ± 4
blu Cherry Crush High Premium	11,700 ± 300	8 ± 3
SKYCIG Classic Tobacco Bold	12,750 ± 295	29 ± 4
SKYCIG Crown Menthol Bold	13,027 ± 280	33 ± 6
Marlboro Gold Box	11,431 ± 80	226 ± 2
L&B Original	12,941 ± 26	232 ± 5
L&B Menthol	12,131 ± 24	194 ± 10

Number of replicates = 3–5

Table 4
Analytical characterization of commercial e-cigarettes and conventional cigarettes collected using CAN parameters – select cigarette HPHC methodology (mg/total puffs collected) summary by analyte classes

	CO	Carbonyls	Phenolics	Volatiles	Metals	TSNAs	PAA	PAH	Sum
Marlboro Gold Box (mg/cig)	27	1.92	0.204	1.430	<0.00020	0.000550	0.000024	0.00222	<30.6 mg
L&B Original (mg/cig)	22	1.89	0.26	1.02	<0.0002	0.000238	0.000019	0.00219	<25.2
L&B Menthol (mg/cig)	20	1.81	0.17	0.94	<0.0003	0.000185	0.000017	0.00153	<22.9
blu CTD (mg/99 puffs)	<0.1	<0.07	<0.001	<0.001	<0.00004	<0.00002	<0.000004	<0.00016	<0.17
blu MMD (mg/99 puffs)	<0.1	<0.08	<0.001	<0.001	<0.00004	<0.00002	<0.000004	<0.00016	<0.18
blu CCHP (mg/99 puffs)	<0.1	<0.05	<0.003	<0.0004	<0.00004	<0.00002	<0.000004	<0.00014	<0.15
SKYCIG CTB (mg/99 puffs)	<0.1	<0.06	<0.0010	<0.008	<0.00006	<0.000013	<0.000014	<0.00004	<0.17
SKYCIG CMB (mg/99 puffs)	<0.1	<0.09	<0.0014	<0.008	<0.00006	<0.000030	<0.000014	<0.00004	<0.20
Air Blank (blu Set) (mg/99 puffs)	<0.1	<0.06	<0.001	<0.0004	<0.00004	<0.00002	<0.000004	<0.00015	<0.16
Air Blank (SKYCIG Set) (mg/99 puffs)	<0.1	<0.05	<0.0009	<0.008	<0.00006	<0.000013	<0.000014	<0.00006	<0.16

< Indicates some or all values were below method limits of quantitation or detection, number of replicates = 3–5.
[a] Formaldehyde, acetaldehyde, acrolein propionaldehyde, crotonaldehyde, MEK, butyraldehyde.
[b] Hydroquinone, resorcinol, catechol, phenol, m-+p-cresol, o-cresol.
[c] 1,3-Butadiene, isoprene, acrylonitrile, benzene, toluene, styrene.
[d] Beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, selenium, tin.
[e] NNN, NAT, NAB, NNK.
[f] 1-Aminonaphthalene, 2-aminonaphthalene, 3-aminobiphenyl, 4-aminobiphenyl.
[g] Naphthalene, acenaphthylene, acenaphthene, fluorine, phenanthrene, anthracene, fluoranthene, pyrene, benzanthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, B(a)P, indeno[1,2,3-cd]pyrene, benzo(g,h,i)perylene.

Table 5
Analytical characterization of commercial e-cigarettes and conventional cigarettes collected using CAN parameters – select cigarette HPHC methodology (μg/puff) summary by analyte classes.

	CO	Carbonyls	Phenolics	Volatiles	Metals[d]	TSNAs	PAA	PAH	Sum
Marlboro Gold Box	2967	211	22	157	<0.026	0.0604	0.00264	0.244	<3357 μg
L&B Original	2683	230	32	124	<0.024	0.0290	0.00232	0.267	<3069
L&B Menthol	2778	251	24	130	<0.042	0.0257	0.00236	0.213	<3183
blu Classic Tobacco Disposable	<1.0	<0.7	<0.01	<0.01	<0.0004	<0.0002	<0.00004	<0.002	<1.7
blu Magnificent Menthol Disposable	<1.0	<0.8	<0.01	<0.01	<0.0004	<0.0002	<0.00004	<0.002	<1.8
blu Cherry Crush High Premium	<1.0	<0.5	<0.03	<0.004	<0.0004	<0.0002	<0.00004	<0.001	<1.5
SKYCIG Classic Tobacco Bold	<1.0	<0.6	<0.01	<0.08	<0.0006	<0.0001	<0.00014	<0.0004	<1.7
SKYCIG Crown Menthol Bold	<1.0	<0.9	<0.01	<0.08	<0.0006	<0.0003	<0.00014	<0.0004	<2.0
Air Blank (blu Set)	<1.0	<0.6	<0.01	<0.004	<0.0004	<0.0002	<0.00004	<0.002	<1.6
Air Blank (SKYCIG Set)	<1.0	<0.5	<0.01	<0.08	<0.0006	<0.0001	<0.00014	<0.001	<1.6

< Indicates some or all values were below method limits of quantitation or detection, number of replicates = 3–5.
[a] Formaldehyde, acetaldehyde, acrolein propionaldehyde, crotonaldehyde, MEK, butyraldehyde.
[b] Hydroquinone, resorcinol, catechol, phenol, m-+p-cresol, o-cresol.
[c] 1,3-Butadiene, isoprene, acrylonitrile, benzene, toluene, styrene.
[d] Beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, selenium, tin.
[e] NNN, NAT, NAB, NNK.
[f] 1-Aminonaphthalene, 2-aminonaphthalene, 3-aminobiphenyl, 4-aminobiphenyl.
[g] Naphthalene, acenaphthylene, acenaphthene, fluorine, phenanthrene, anthracene, fluoranthene, pyrene, benzanthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, B(a)P, indeno[1,2,3-cd]pyrene, benzo(g,h,i)perylene.

Table 6
Per puff comparisons of quantifiable analytes for blu eCigs products from CAN puffing – yields and ratios to conventional product yields.

	Marlboro Gold Box µg/puff	blu MMD µg/puff	MGB/blu MMD
Acrolein	16.4 ± 0.2	0.19 ± 0.06	86
Phenol	1.53 ± 0.16	0.0017	900

[a] Fewer than three replicates were quantifiable; no standard deviation is listed.

Table 7
Per puff comparisons of quantifiable analytes for SKYCIG products from CAN puffing – yields and ratios to conventional product yields.

	I&B average µg/puff	SKYCIG CTB µg/puff	SKYCIG CMB µg/puff	I&B average/SKYCIG CTB	I&B average/SKYCIG CMB
Acetaldehyde	174	–	0.32	–	544
Acrolein	17	0.15 ± 0.02	–	113	–
Propionaldehyde	12	–	0.11 ± 0.05	–	109
N-Nitrosoanatabine	0.010	–	0.0002 ± 0.0001	–	50

[a] Fewer than three replicates were quantifiable; no standard deviation is listed.

All analytes tested were present in the cigarette smoke at quantifiable levels except for select metals. These results are consistent with internal historical results for commercial cigarettes tested under the CAN smoking regime. For the cigarette samples, the total yield range was 3069–3350 µg/puff of HPHCs tested.

Of the 55 HPHCs tested in aerosol, 5 were quantifiable in an e-cigarette sample but not the associated air blank. The quantifiable results for aerosol are listed in Tables 6 and 7 in contrast with the conventional cigarettes from the same geographical region. The five analytes which were quantifiable were statistically different ($p < 0.05$) at levels 50–900 times lower than the cigarette smoke samples. Phenol was quantified in one e-cigarette product at 900 times lower than cigarette smoke. N-Nitrosoanatabine was quantified in one product at 50 times lower than cigarette smoke. Three carbonyls (acrolein, acetaldehyde, and propionaldehyde) were quantified at 86–544 times lower than cigarette smoke.

All other analytes were not quantifiable above the air blanks in aerosol samples. The e-cigarettes and air blanks total yields for analytes were <2 µg/puff which is 99% less than the approximately 3000 µg/puff quantified for the cigarette smoke samples. Thus, the results support the premise of potentially reduced exposure to HPHCs for the e-cigarette products compared to conventional cigarette smoke.

4. Conclusions

The purpose of this study was to determine content and delivery of e-cigarette ingredients and to compare e-cigarette aerosol to conventional cigarettes with respect to select HPHCs for which conventional cigarette smoke is routinely tested. Routine analytical methods were adapted and verified for e-cigarette testing. Aerosol collection was conducted using conventional smoking machines and an intense puffing regime. As machine puffing cannot, and is not intended to, mimic human puffing, results of this study are limited to the scope of the comparisons made between the e-cigarette and conventional cigarette products tested.

The main ingredients for the e-cigarettes tested were consistent with disclosed ingredients: glycerin and/or propylene glycol (≥75%), water (≤18%), and nicotine (~2%). Machine-puffing of these products under a standardized intense regime indicated a direct transfer of these ingredients to the aerosol while maintaining an aerosol composition similar to the e-liquid. Nicotine yields to the aerosol were approximately 30 µg/puff or less for the e-cigarette samples and were 85% lower than the approximately 200 µg/puff from the conventional cigarettes tested.

Testing of the e-cigarette aerosol indicates little or no detectable levels of the HPHC constituents tested. Overall the cigarettes yielded approximately 3000 µg/puff of the HPHCs tested while the e-cigarettes and the air blanks yielded <2 µg. Small but measurable quantities of 5 of the 55 HPHCs tested were found in three of the e-cigarette aerosol samples at 50–900 times lower levels than measurable in the cigarette smoke samples. Overall, the deliveries of HPHCs tested for the e-cigarette products tested were more like the study air blanks than the deliveries for the conventional cigarettes tested. Though products tested, collection parameters, and analytical methods are not in common between this study and others, the results are very consistent. Researchers have reported that most or all of the HPHCs tested were not detected or were at trace levels. Burstyn (2014) used data from approximately 50 studies to estimate e-cigarette exposures compared to workplace threshold limit values (TLV) based on 150 puffs taken over 8 h. The vast majority of the analytes were estimated as ≪1% of TLV and select carbonyls were estimated as <5% of TLV. Cheng (2014) reviewed 29 publications reporting no to very low levels of select HPHCs relative to combustible cigarettes, while noting that some of the tested products exhibited considerable variability in their composition and yield. Goniewicz et al. (2014) tested a range of commercial products and reported quantifiable levels for select HPHCs in e-cigarette aerosols at 9- to 450-fold lower levels than those in cigarette smoke that in some instances were on the order of levels determined for the study reference (a *medicinal* nicotine inhaler). Laugesen (2009) and Theophilus et al. (2014) have presented results for commercial e-cigarette product liquids and aerosols having no quantifiable levels of tested HPHCs, or extremely low levels of measurable constituents relative to cigarette smoke. Additionally, findings from several recent studies indicate that short-term use of e-cigarettes by adult smokers is generally well-tolerated, with significant adverse events reported relatively rarely (Etter, 2010; Polosa et al., 2011, 2014; Cahn and Siegel, 2011; Cahn et al., 2013; Dawkins and Corcoran, 2014; Hajek et al., 2014). Thus, the results obtained in the aforementioned studies and in the present work broadly support the potential for e-cigarette products to provide markedly reduced exposures to hazardous and potentially hazardous smoke constituents in smokers who use such products as an alternative to cigarettes.

Additional research related to e-cigarette aerosol characterization is warranted. For example, continued characterization of

major components and flavors is needed. Establishment of standardized puffing regimes and reference products would greatly aid sharing of knowledge between researchers. Continued methods' refinement may be necessary for improved accuracy for quantitation of analytes at the low levels determined in this study. To that end, it is critical that negative controls and steps to avoid sample contamination be included when characterizing e-cigarette aerosol since analytes are on the order of what has been measured in the background levels of a laboratory setting. Though researchers have reported quantification of select analytes, great care must be taken when interpreting results at such trace levels.

Conflicts of interest

The company for which the study authors work and the companies that manufacture the e-cigarettes tested for this study are owned by the same parent company.

Acknowledgments

We thank the analytical testing laboratories at Lorillard Tobacco Company for methods development and testing and Drs. Brown, D'Ruiz, Heck and Stevens for technical discussions.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.yrtph.2014.10.010.

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10 Health Experts who endorse E-Cigarettes

Dr. Murray Laugesen (MBChB), Director at Health NZ Ltd

Registered as a medical practitioner since the 1960s, Dr Murray Laugesen is New Zealand's most respected tobacco policy and health researcher. After 18 years of service in the New Zealand public health sector, Dr Laugesen was awarded a medal of recognition by the World Health Organisation for

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his contribution to the concept of tobacco-free societies.

Dr Laugesen currently acts as the director of Health New Zealand Ltd, where he works to advance New Zealand's health goal of becoming a smoke-free nation by 2025. Having conducted extensive laboratory tests on the safety and efficacy of electronic cigarettes as smoking cessation aids, he is optimistic about the role they could play in achieving this goal.

Quotes on Electronic Cigarettes:

"Inhaling mist from the e-cigarette is rated several orders of magnitude (100 to 1000 times) less dangerous than smoking tobacco cigarettes."

"... nicotine is one of the safest of drugs, and is being sold as the alternative to the most dangerous consumer product – the tobacco cigarette. Low risk compared to cigarettes is the real world risk that smokers face."

"E-cigarettes are caught in a two-box regulatory trap. Nicotine products are in law usually either tobacco products or medicines. From a smoker's viewpoint, however, it belongs in a third box, as a lifestyle choice or cigarette alternative. Big Tobacco controls Box no. 1, Big Pharma and the white coat health professional prescribers and dispensers control Box no. 2, while many smokers addicted to nicotine, the ones most likely to be sitting on death row, are powerless. They would like to buy from Box no. 3, but it is empty."

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Dr. Michael Siegel (MD), Professor at Boston University School of Public Health

With a career in tobacco control and research spanning over 25 years, Dr Michael Siegel is a vocal supporter of electronic cigarettes as tools for tobacco harm reduction. Prior to becoming vaping advocate, he contributed to significant advances in United States policy reform on tobacco advertising and smoke-free workplaces.

In addition to teaching at Boston University's School of Public Health, Professor Siegel writes about the latest developments in smoking related research and policy at **his blog**. He claims that the tobacco control movement regularly misleads the public with junk science or outright false claims about the "dangers" of vaping.

Quotes on Electronic Cigarettes:

> *"This is an important effort that could result in saving countless lives. I find it interesting and quite informative that while anti-smoking groups are promoting nicotine replacement therapy via pharmaceutical products – which have dismal efficacy – they are seeking a ban on nicotine replacement therapy via e-cigarettes, which appear to actually be reasonably effective."*

"The anti-smoking movement's ideology – which is guided by an abstinence-only type of philosophy – just doesn't have room for a product [the e-cigarette] that looks and acts like a cigarette but happens to be orders of magnitude safer. In this case, the science – the health effects – just don't matter. The ideology is too deeply ingrained to allow the product to be given a chance of saving lives."

"[The electronic cigarette] is substantially safer than the conventional cigarette. Inhaling nicotine cannot be nearly as dangerous as inhaling nicotine plus thousands of other chemicals, including more than 40 carcinogens. It doesn't take long-term studies to make that determination ... determining that a tobacco-free nicotine delivering product is safer than a product that delivers nicotine with thousands of tobacco smoke constituents is a fact of basic science, and anyone who challenges such a notion would probably benefit from a remedial course in basic sciences."

Dr. Riccardo Polosa (MD, PhD), Professor at Italy's University of Catania

One of Europe's foremost experts on tobacco addiction, Dr Riccardo Polosa lead the world's first randomised controlled trials on electronic cigarettes as smoking cessation devices. The results of the trials deeply impressed Dr Polosa, as they proved both safe and highly effective as quit aids – even on trial subjects who were unwilling to quit smoking!

Professor Polosa leads the University of Catania's Centre for Tobacco Research, where he frequently publishes academic papers on aspects of nicotine addiction, tobacco harm reduction, and the impact of smoking on respiratory health. He also promotes the use of e-cigarettes as a low risk smoking alternative in his capacity as a director of the Italian Anti-Smoking League

Quotes on Electronic Cigarettes:

"Clearly, the rapidly expanding popularity of e-cigs represents a threat to the interests of many, including national governments – because of the fat revenues generated by tobacco excise taxes. Only if these obstacles can be overcome, a truly sensible and rational regulation of e-cigs will be agreed upon, and millions of lives saved."

"The status quo in smoking cessation presents smokers with just two unpleasant alternatives: quit or die. But, there is a third choice for smokers: switching to the e-cig. The use of e-cig allows smokers to introduce nicotine from a much safer source than a lit cigarette and to keep the gestures associated with smoking."

"Working in the area of nicotine dependence for many years has convinced me that we, as health professionals, should also take care of the smokers who are unable or unwilling to

quit. To this end, the e-cig is an opportunity not to be missed."

Dr. Konstantinos Farsalinos (MD), Researcher at Greece's Onassis Cardiac Surgery Center

From a distinguished medical background as a practicing cardiologist, Dr Konstantinos Farsalinos has been actively studying the impact of tobacco smoking on cardiac health since 2010. From 2011, he lead some of the world's first clinical and laboratory trials on the use, safety and harm reduction potential of electronic cigarettes.

In 2013, Dr Konstantinos Farsalinos conducted a ground-breaking global survey of over 19,000 electronic cigarette users. The results indicated that switching from smoking to vaping had "significant health benefits". He founded the website E-Cigarette Research Advocates Group to keep the public informed the survey outcomes, plus other important developments in electronic cigarette research and legislation.

Quotes on Electronic Cigarettes:

"I believe most of the people expressing negative opinion about e-cigarettes don't really have any deep knowledge about the products. If you're expressing your opinion about e-cigarettes in public you should know what you're talking about, because the things we say as scientists influence a lot of people."

"I know a lot of smokers who were put off right at the point of trying an e-cigarette. Even worse, I've seen a lot of vapers go back to smoking after hearing scientists discuss the potential hazards of e-cigarettes – the problem is that they often forget to mention the dangers of smoking."

"Most authorities simply do not like the name e-cigarettes. And they do not like that they have nicotine, they mimic smoking and they provide pleasure to the user. However, these are the main reasons for their success, and these features are not present in any other medicinal smoking-cessation product. That is why every other product has failed..."

Dr. Jean-François Etter (PhD, MPH), Professor at University of Geneva

With an academic background in public health, political sciences and epidemiology, Dr Jean-François Etter has worked in the field of smoking addiction and treatment for nearly two decades, and has written over 120 peer-reviewed papers on the physical, psychological and social impacts of tobacco use. His extensive research on electronic cigarettes has made him a firm advocate of vaping as less harmful alternative to conventional smoking.

In 2013, Professor Etter published **The Electronic Cigarette: An Alternative to Tobacco?**, a short book summarising his e-cigarette research findings in easy-to-understand language.

The same year, he presented alongside other public health professionals at The E-Cigarette Summit in London, which was the world's first large-scale gathering for the discussion and debate of electronic cigarette science, safety and regulation.

Quotes on Electronic Cigarettes:

"This is one of the very first studies of vapers with 12 months follow-up. We found that very few ex-smokers relapsed to smoking, and that many smokers (i.e. dual users) either reduced or quit smoking after 12 months."

"Even if there are long-term vapers, this is not a problem, as long as they quit smoking. The problem is combusted tobacco, not nicotine. At the dosage used by vapers or users of nicotine gums or patches, nicotine is not toxic. Long term vaping is not a public health problem; not any more than long term use of nicotine gums."

"Our data (and other studies) suggest that e-cigs are not very addictive, much less addictive than tobacco cigs. The conventional definition of addiction has two components (compulsive use in spite of harm). Because e-cigs do not cause harm, it is more appropriate to talk about compulsive use rather than of addiction in the case of e-cigs."

Dr. Joel L. Nitzkin (MD, MPH, DPA)

With doctorates in medicine and public administration, a master degree in public health, and a forty-year career in public health and tobacco control policy, Dr Joel Nitzkin has both the education and the experience to back up his support of electronic cigarettes.

While serving as the Chair of the American Association of Public Health Physicians' (AAPHP) Tobacco Control Task Force, Dr Nitzkin strongly advocated the adoption of policies aimed at tobacco harm reduction (THR) via less dangerous alternatives to smoking, vs. the "quit or die" approach favoured by public health powers

Now an expert adviser to the R Street Institute, a public health policy "think tank", Dr Nitzkin continues to promote the message that e-cigarettes and similar smokeless products should be seen as part of the cure to the global epidemic of smoking-related diseases – and definitely not as part of the problem!

Quotes on Electronic Cigarettes:

"E-cigarettes can and should be marketed as a substitute for conventional cigarettes for smokers unable or unwilling to quit."

"E-cigarettes deliver the same nicotine found in the pharmaceutical products, with no more contamination by toxic substances than the pharmaceutical products already approved

by the FDA."

"... we have every reason to believe that the hazard posed by e-cigarettes would be much lower than one percent, probably lower than one tenth of one percent, of the hazard posed by regular cigarettes."

Dr. Carl Phillips (MPP, PhD)

A Harvard doctorate in public policy and a post-doctorate in public health are among Dr Carl Phillips' credentials in the field of tobacco control. He is generally recognized as one of the world's top two academic experts on tobacco harm reduction (THR), which he defines as "the public health strategy of encouraging smokers to switch to low-risk alternatives like smokeless tobacco and e-cigarettes."

While an associate professor of public health at the University of Alberta, Dr Phillips co-founded the TobaccoHarmReduction.org education and research program and conducted multiple studies that pointed to the health advantages of vaping vs. smoking. He has also built a reputation for "naming and shaming" individuals and organizations that spread fear-mongering misinformation about e-cigarettes on his blog Anti-THR Lies.

Dr Phillips currently serves as Scientific Director on the board of the Consumer Advocates for Smoke-free Alternatives Association (CASAA), a United States-based group dedicated to protecting vapers' rights, and educating the public about electronic cigarettes.

Quotes on Electronic Cigarettes:

"E-cigarettes are not just a huge public health breakthrough. They are one of the most impressive examples of People Power of recent times, and should be mentioned alongside the Arab Spring and Occupy ... e-cigarettes seem to have mobilized an unstoppable push-back against the failed "quit or die" approach that those in power are trying to impose on an unwilling population."

"Nicotine has about the same implication for health as coffee and fries."

"Three months of additional smoking poses a greater risk to someone's health, on average, than a lifetime of using a low-risk alternative."

Dr. Brad Rodu (DDS)

Alongside his colleague Carl Phillips, Dr Brad Rodu is the world's foremost authority on tobacco harm reduction. He has devoted over 20 years to the study and analysis of THR, during which time he has acted as the lead researcher on multiple THR clinical trials, and published over 150 scholarly articles on the subject.

Coming from a background in oral medicine, Dr Rodu's early THR research focused on chewing or smokeless tobacco. In 1995, he published the book For Smokers Only: How Smokeless Tobacco Can Save Your Life, described as "An explanation on the advantages of smokeless tobacco to cigarettes and as a better alternative to the nicotine patch".

Following the invention and rise of electronic cigarettes, Dr Rodu noted that vaping was certain to "play a major role" in the evolution of THR. As the Professor of Medicine at the University of Louisville, where he holds an Endowed Chair in tobacco harm reduction research, Dr Rodu continues to champion the use of e-cigarettes and other less harmful alternatives to smoking.

Quotes on Electronic Cigarettes:

"Sadly, the potential of tobacco harm reduction is threatened by opposition from many major medical organizations and government agencies. Obsessed with a myopic vision of a tobacco-free society, they have transformed a legitimate war on smoking into a moral crusade against tobacco, a mistake that was tragically made with alcohol almost 100 years ago."

"There is no public health justification for denying smokers information about and access to safer sources of tobacco and nicotine."

"There is substantial and compelling scientific research documenting that consuming the ingredients in e-cigarettes (nicotine, propylene glycol, water and flavors) is vastly safer than burning tobacco and inhaling 3000+ toxic by-products."

Dr Adrian Payne (PhD, BSc)

With a doctorate in pharmacology and bachelor of science from the University of London, Dr Adrian Payne has held numerous senior level research and management positions at multinational companies in the pharmaceutical and tobacco industries. with a focus on corporate social responsibility and tobacco harm reduction.

In addition to his work in the private sector, Dr Payne is an Adjunct Professor of Global Citizenship at the Hult International Business School in London. He has also lectured on tobacco harm reduction at the University of Geneva and George Washington Business School, and published numerous peer-reviewed scientific

articles.

In 2007, Dr Payne drew on his two decades of experience as a pharmacologist specializing in tobacco harm reduction to found Tobacco Horizons, THR consultancy agency. In his capacity as managing director, he presented at Harm Reduction International on the urgent need for electronic cigarettes and other smokeless non-pharmaceutical nicotine products to be globally recognized as low-risk alternatives to conventional tobacco cigarettes.

Quotes on Electronic Cigarettes:

"Certainly large pharmaceutical companies with interests in stop-smoking medicines provide very substantial financial support to some of the 'public health' groups that are calling for e-cigarettes to be banned."

"Some detractors claim that making E-cigarettes available encourages dual-use in combination with cigarettes and thus delays quitting smoking. But the same criticism could equally well be directed towards medicinal nicotine products marketed to relieve cravings during temporary abstinence from smoking."

"... it really would be a cruel irony if smokers who had switched to E-cigarettes were forced to revert to smoking regular cigarettes."

Dr Robert West (PhD, BSc)

With a doctorate in psychology and over 30 years of experience in smoking cessation research, Dr Robert West currently serves as Professor of Health Psychology and Director of Tobacco Studies at the University College London. In line with his decades-long professional interest in smoking behaviors, he is also the editor-in-chief of the scientific journal *Addiction*.

During his academic career, Dr West has conducted intensive research and numerous laboratory studies in the areas of smoking addiction and cessation. The outcomes of his research have lead Dr West to become an advocate of THR, particularly in regard to electronic cigarettes, which have been shown to satisfy not only the chemical (nicotine) aspect of smoking addiction, but the behavioural (hand-to-mouth motion) aspect as well.

Having investigated the ingredients of e-cigarettes and e-liquid (propylene glycol, glycerin and flavourings), Dr West is dismissive of unfounded claims that vaping poses any non-trivial risk to human health. Instead, he is hopeful that global health authorities will unite behind the electronic cigarette and its unique, powerful potential to advance THR goals.

Quotes on Electronic Cigarettes:

"E-cigarettes could substantially improve public health because of their widespread

appeal and the huge health gains associated with stopping smoking."

"We have such a massive opportunity here. It would be a shame to let it slip away by being overly cautious. E-cigarettes are about as safe as you can get."

"If those young people are people who would have smoked but instead they're using e-cigarettes, then that's a huge public health gain. If they're people who would never have smoked but they've taken up e-cigarettes, frankly in public health terms it's not really an issue – it's like drinking coffee or something, there's no real risk associated with it."

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