HB

40

PUBLIC TESTIMONY

<TARGET><BILL>HB 40</BILL><SUBJECT>HB 40 PUBLIC TESTIMONY</SUBJECT><COMM>HHSS29</COMM></TARGET>

HB 40

LETTERS OF SUPPORT

From: Thomas McGrath [redacted]
Sent: Thursday, March 12, 2015 9:43 AM
To: Rep. Paul Seaton
Subject: HB40: Use of Electronic Cigarettes as Smoking

Dear Reprentative Seaton:

I encourage you to pass HB40 out of your committee. As you know, in Anchorage, as in most places smoking is not allowed in work places which includes restaurants and bars. E-cigarettes should be included, as banned products, in the same places as other smoking materials.

I have a business associate that owns several E-cigarette businesses. He claims that all of his materials come from reputable suppliers and do not contain unknown products but he admits that most of these types of businesses get their products from China and have no idea what chemicals the products contain. Possibly putting carcinogens in the air should not be allowed if at all possible. One way to limit risk of the unknown in this area is to not allow it.

I was a smoker for a several years but quit smoking in September of 1981. I thought I was safe but several years ago I developed bladder cancer. After several surgeries and a lot of treatments I am now cancer free but routinely get tested to make sure that the cancer has not returned. This will be a lifelong look in the rear view mirror for me. I was told by Doctors at the Mayo Clinic in Rochester, MN that they are pretty sure that my cancer was caused by smoking or exposure to second hand smoke. They also said that if smoking ended today at least 80% of cancer would not happen. We can't all be experts in every area but it is generally agreed upon that the Mayo clinic is the world leader in this area.

Starting years ago, before current laws were in place my wife and I avoided places where smoking took place. We do not allow cigarette or other smoking, including E-cigarette smoking in our sphere of influence and will not go where these devices or substances are used.

I encourage you to pass HB40 so that I and others will not have to worry about being assaulted by substances that may injure.

Thank You

Tom McGrath

From: Terrence Robbins [redacted]
Sent: Thursday, April 02, 2015 10:52 AM
To: Rob Earl
Subject: HB40 Comment

Please pass HB40! As a lifelong Alaskan who began chewing tobacco that was heavily flavored (Kodiak) at the age of 13, I spent the next 20 years addicted to nicotine, eventually chewing unflavored Copenhagen tobacco as I grew up. I finally used Commit lozenges as a tool to quit, but part of quitting involved breaking the oral habits and routines. What I discovered was that Commit kept me addicted to nicotine! I used Commit for two years before I was finally able to quit while on an trip to a country where I couldn't find more lozenges. In my opinion, e-cigs are just a new method of flavored nicotine ingestion to initially addict our youth, therefore creating a new generation of smokers and profits for those who don't care about the health of their customers.

Thank you!

Terrence Robbins
Ketchikan Resident

From: Amy Gorn [redacted]
Sent: Thursday, April 02, 2015 9:50 AM
To: Rob Earl
Subject: HB40 testimony

Dear Members of the House Health and Social Services Committee,

My name is Amy Gorn and I am a Wasilla resident. I grew up as a secondhand smoker, meaning in a home with parents who smoked. As a result, my brother and myself had and continue to have respiratory impacts from that longtime exposure. Over the last couple of years I have seen the rise in use of electronic cigarettes and I have been exposed to the aerosol emitted from these devices. I can say without exaggeration or doubt that what I breathed in from "vape pens" affected my health in a disturbing way I had never experienced in 18+ years of living with cigarette smoke. The way I breathed and the headaches I suffered were unlike anything else I felt around traditional smoke. This "vapor" disturbed me greatly and I would feel better as soon as I cleared or move away from it.

I have vowed to never be around secondhand aerosol from e-cigarettes again. I wish to never feel the way I did around it and I can only presume the chemicals or ingredients are something that the public should also be protected from. I am very concerned about what I breathed in and I don't think they should be used in public spaces, especially around my three-year old daughter.

The FDA has not included e-cigarettes as an approved cessation device like it has for nicotine inhalers; I don't feel the cessation position or argument holds water until the FDA gives final word.

Overall, I am in full support of HB40 and urge you to pass and protect my health.

Thank you and sincerely,

Amy Gorn
907-315-5510

AMERICAN LUNG ASSOCIATION®
IN ALASKA

500 W Int'l Airport Road
Suite A
Anchorage AK 95518
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800-LUNG-USA
(800-586-4872)

March 3, 2015

To Whom it May Concern:

I am writing in support of House Bill 40 (HB40), as introduced by Representative Bob Herron.

We strongly support prohibiting the use of Electronic Nicotine Delivery Systems (ENDS or E-Cigs) in places open to the public and places of employment. We support inclusion of E-Cigs in the definition of "tobacco product" and "smoke or smoking" in the smoke-free workplace law, and to prohibit the use of E-cigs in the places where smoking is prohibited. Including electronic smoking devices will protect the public from involuntary exposure to psychoactive substances and health effects thereof, both known and unknown.

HB40 is the first step to protecting employees and the public from inadvertent exposure to nicotine and other chemicals and poisons. E-Cigs are not FDA approved smoking cessation devices and do not emit harmless water vapor. Studies have found formaldehyde, benzene and tobacco-specific nitrosamines (a carcinogen) coming from the secondhand emissions from e-cigarettes. Nicotine levels due to secondhand aerosol exposure have been found to be equivalent to those exposed to secondhand smoke.

The standard must be clean air, free of both smoke and aerosol.

Sincerely,

Marge Stoneking
Executive Director

March 4, 2015

Representative Bob Herron
Alaska State Capitol
Juneau, AK

Dear Representative Herron:

On behalf of the American Cancer Society Cancer Action Network (ACS CAN), I am writing in support of House Bill 40. Thank you for bringing the potential hazards of secondhand electronic cigarette aerosol to the public's attention through this legislation.

A growing number of studies have examined the contents of e-cigarette aerosol. Unlike a vapor, an aerosol contains fine particles of liquid, solid, or both. Propylene glycol, nicotine, and flavorings were most commonly found in e-cigarette aerosol. Other studies have found the aerosol to contain heavy metals, volatile organic compounds and tobacco-specific nitrosamines, among other potentially harmful chemicals.

While the health effects of e-cigarettes are currently under study, there are serious questions about the safety of inhaling the substances in e-cigarette aerosol. Studies have shown that the use of e-cigarettes can cause short-term lung changes and irritations, while the long-term health effects are unknown. Both exposure to and health effects of secondhand aerosol from e-cigarettes require further research, but preliminary studies indicate nonusers can be exposed to the same potentially harmful chemicals as users, including nicotine, ultrafine particles and volatile organic compounds.

ACS CAN advocates for comprehensive smoke-free laws in all workplaces to protect workers and the public from the harmful effects of secondhand exposure and to create communities that support tobacco-free living. Electronic cigarettes, or e-cigarettes, including supposed non-nicotine e-cigarettes, should also be prohibited in all workplaces, restaurants, and bars to protect against secondhand exposure to nicotine and other potentially harmful chemicals, to ensure the enforcement of existing smoke-free laws are not compromised, and that the public health benefits of a smoke-free laws are not undermined.

Thank you again for bringing this important issue forward for public discourse, and for your work to protect the health of all Alaskans.

Sincerely,

Emily E. Nenon
Alaska Government Relations Director
3851 Piper Street, Suite U240 • Anchorage, AK • 99508
Phone 907.277.8696 • Fax 907.273.2073

Alaska State Legislature

Please enter into the record my testimony to the House Health & Social Services Com.
Committee name

Committee on HB40, dated 3/12/15
Bill/Subject

I am here today in support of HB40, to ask that you treat e-cigarettes the same as traditional cigarettes in regard to secondhand smoke exposure. The vapor emitted by these devices has been proven to contain ultra-fine particles that, when inhaled, exacerbate respiratory issues such as asthma. The vapor is also known to contain chemicals such as benzene, cadmium and formaldehyde. Additionally, flavored vape juices, such as cotton candy and gummi bear, are specifically designed to entice youth into using them.
There was a time when the tobacco industry told us that secondhand smoke was harmless. We now know different. I am reluctant to trust them when they say that e-cigarettes and second hand aerosol are safe. Nobody should be unwillingly exposed to a substance that can harm them. I ask you to support HB40, because everyone deserves the right to breathe clean air.

Signed: [signature]
Testifier

Self
Representing (Optional)

819 W Terry L Circle, Wasilla AK 99623
Address

907-841-9115
Phone number

Alaska State Legislature

Please enter into the record my testimony to the HHSS
Committee name

Committee on HB40, dated 3-12-15
Bill/Subject

I want to testify in favor of HB40 and the importance of treating electronic cigarettes the same as traditional cigarettes with regard to second-hand smoke. The "vapor" from an e-cigarette is not water vapor, but is in fact an aerosol that contains nicotine and toxic chemicals (CDC). It is not safe to smoke or inhale.

As a mother of two daughters, aged 11 and 14, I am horrified by the messages that they see in ads and in stores promoting e-cigarettes as safe. This simply is not true. We are in danger of the re-normalization of smoking with the emergence of these new products, and as leaders and decision makers in health care, we must send a clear message that "smoking" includes the use of electronic cigarettes.

Thank you.

Signed: Misty M. Jensen
Testifier

Representing (Optional)

2075 S. Togiak Ave. Apt 2, Wasilla, AK 99654
Address

907-715-6316
Phone number

Alaska State Legislature

Please enter into the record my testimony to the House Health & Social Services
Committee name

Committee on HB 40-an act relating to electronic cigarettes, dated March 12, 2015
Bill/Subject

I support HB 40 and urge you to add electronic cigarettes to existing state law (AS 18.35.365) and treating electronic cigarettes the same as traditional cigarettes, with regard to tobacco use and secondhand smoke. Electronic cigarettes and other nicotine delivery devices contain many of the hazardous chemicals and carcinogens found in traditional cigarettes. As such, the vapor they emit poses the same public health risks as secondhand smoke and should be treated accordingly.

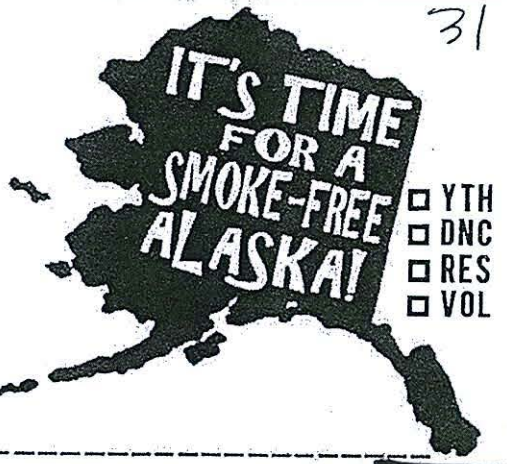
Signed: Becky Stoppa (Becky Stoppa)
Testifier

SeH
Representing (Optional)

3250 N Tungsten Dr Wasilla, AK 99654
Address

907-841-0470
Phone number

EVERYONE HAS THE RIGHT TO BREATHE SMOKE-FREE AIR.



I want my elected representative and senator to support a statewide smoke-free indoor workplace law in Alaska.

NAME: Brent Johnson

PHYSICAL ADDRESS: [redacted] CITY/ZIP: [redacted]

EMAIL: [redacted] PHONE: [redacted]

I would like to help to get a statewide smoke-free indoor workplace law passed by...

[redacted] Calling my legislators [redacted] Writing a letter to the editor [redacted] I don't know, tell me what you need

Cancer Action Network — American Cancer Society

AMERICAN LUNG ASSOCIATION. IN ALASKA

ALASKA NATIVE HEALTH BOARD

American Heart Association | American Stroke Association

AARP

SAMPLE OF 15 CARDS SUBMITTED.

HB 40

INDIVIDUAL LETTERS IN OPPOSITION

March 9, 2015

Dear Paul Seaton,

My Name is Felipe Concepcion and 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. I am a resident of Alaska and this issue is very important to me due to the fact that this product help me quit smoking conventional cigarettes and chewing and quite possibly save my life. Before using an Electronic Cigarette, I smoked for 20+ years in addition to using smokeless tobacco (Chewing) for the last 6 years that I smoked. I have tried numerous times to quit cold turkey with no success and even changing to smokeless tobacco which created second addiction to tobacco. I have been using an Electronic Nicotine Delivery System (ENDS) or commonly known as e-cigarette since October 11, 2013 (11:40 am) and have not picked up a cigarette or a chew since then. My health has improved tremendously to the point that I am not struggling to breathe anymore when engaging in any physical activity. I can breathe better, smell better, taste better I am living a healthier lifestyle, by the aid of these less harmful and or safer alternatives that are electronic cigarettes.

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,
Felipe Concepcion

Rebecca Hutchins
Anchorage, AK 99504

March 9, 2015

Dear Paul Seaton,

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.

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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 smoked 3 packs a day and smoked for 30 years. I tried all of the available options to stop smoking. I completely destroyed my digestive tract using gum and lozenges. I was unable to eat and lost 50 lbs in 6 weeks. I lived on Ensure for months. I discovered vaping and was able to stop smoking and it also allowed my body to heal!

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,
Rebecca Hutchins

-----Original Message-----
From: Whitney Parker
Sent: Tuesday, March 10, 2015 6:39 AM
To: Rep. Paul Seaton
Subject: Please Oppose SB 1 and HB 40 and any other effort to treat e-cigarettes like smoking.

Whitney Parker
Wasilla, AK 99687

March 10, 2015

Dear Paul Seaton,

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.

Quitting smoking and switching to electronic has allowed me to breathe again. I can chase after my 6 year old. I can walk a flight of stairs without feeling like my chest is going to explode. Lumping electronic cigarettes in with smoking is the wrong thing to do. There are so many people who's lives have changed for the better.

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,
Whitney Parker

Email received on March 11, 2015

Representative Seaton,

After reading through the documents of this bill, I felt the need to properly inform you of some of the misinformation being presented by the sponsor. The provided PowerPoint presentation in the documents section regarding electronic cigarettes has many false or half-truths throughout it. This letter will follow the outline of that presentation in order to correct the statements made.

Firstly, the lack of factual information regarding equipment types is astounding. The terms vape-pen, e-hookah, and hookah pen are in no way used by anyone other than those attempting to outright ban the use of electronic cigarettes. Cartomizers are not a tank system, and are actually seldom used today. Tank systems are either of two type, clearomizer or Refillable Tank Atomizer(RTA). Devices are not "hacked" or modified, but rather a person can take one design and find ways to make it better. This is one of the founding principles of our country, ingenuity. The industry has self-evolved into its own systems of checks and balances to ensure the safety of the product users, without government interference. And finally regarding systems, dry herb vaporizers are NOT electronic cigarettes. This is one of the largest misconceptions to what the industry is about. The inclusion of the slide showing these types of systems shows exactly what the author is trying to do, demonize a potential life saving system.

Regarding the health effects, especially to bystander, the author fails to mentions much needed facts when making their case. Let's take carcinogens for instance. Nearly anything can create a possible carcinogen when burned. The cited studies by the author do just that; take a device, use it well beyond its intended settings, and blatantly say that it created a carcinogen. They fail to mention that at the proper settings, there were no detection of any potentially harmful substance, just the worst case scenario from a device that would be completely unusable. A more unbiased study, which states both proper and improper usage would be http://www.nejm.org/doi/full/10.1056/NEJMc1413069. Notice that when used properly, they determined that there were no harmful byproducts. But, when you are looking to find a result, stretch something beyond its limits to achieve that desired result. With that said, there have been several studies stating that threat to bystanders is at a zero risk, including http://www.biomedcentral.com/1471-2458/14/18/abstract. Or we can take it a step further and show that testing done on electronic cigarettes can be compared to a standard air blank, http://www.sciencedirect.com/science/article/pii/S0273230014002505.

Finally, the use of words like "Could" or "Can" is a sign that the author has little factual evidence to support the statements they have made. The potential for something to cause harm also means that the potential to not cause harm exists. Evidence also shows, contrary to the presentation, that the use of electronic cigarettes does work as a cessation method in the battle against tobacco addiction, see http://www.ncbi.nlm.nih.gov/pubmed/24846453.

In closing, electronic cigarettes are not a tobacco product, and have been ruled as such in a Nevada court. It is time that they are not demonized as being such, because they do have the potential to be a significant weapon against big tobacco. This bill should not be allowed any further passage all because the sight of it offended someone. That is not what our state government is for.

Thank you,

Jason Finney

North Pole, AK

907-322-1301

Thank you for taking the time to hear what i have to say

in Sen. Herrons sponsor statement he states that he felt the need for this bill because of the Alaska Department of Health & Social Services statement on Electronic Cigarettes in may of 2014, most importantly this part "Secondhand e-cigarette aerosol … contains nicotine, ultrafine particles and low levels of toxins that are known to cause cancer. The FDA's initial investigation into the content of e-cigarettes found the aerosol potentially hazardous to the public's health due to tobacco-specific nitrosamines and other volatile organic compounds" lets take that statement and break down their concerns.

secondhand nicotine: In the 2012 clearstream study they found No detectable levels of toluene, xylene, Carbon monoxide, Nitrogen Oxides, nicotine, or acrolein.in passive vaping.
a new 2014 article by Dr. Farsalino looks at a nov. 2014 study by Spains Tobacco Control Unit, which did find some nicotine exposure with passive vaping over time, about 0.025mg a day. which is slightly more nicotine than what the average hothouse tomato contains. The European Food Safety Authority says to have any harmful effects you need to ingest 0.008mg per KG of bodyweight. and by harmful effects they mean your heart rate increases slightly, the average 180lb man would have ingest 0.64mg passively for it to have even the littlest effect on them.

Ultrafine particles: this is vague, and seems to be added because its a scary buzz word. ultrafine particles is a term of measurement of size, anything less than 100 nanometers in diameter. silt blowing in the valley can be considered to exposure to ultrafine particles, as can the pith of orange as it tears when you peel an orange, ocean spray from crashing waves, even printing this document has possible exposure to ultrafine particles.

low levels of toxins that are known to cause cancer, yes the levels are so low that they aren't even a risk as noted in the 2012 study in inhaled toxicology, and well below what the FDA considers a risk, you are more at risk breathing in the air as you walk the coastal trail, or are outside in fairbanks during the winter.

i have submitted this as a written testimony as well with the peer reviewed studies included please look at them and don't make those of us who have quit smoking or are trying to quit smoking go outside and be exposed to the second hand smoke we fought so damn hard to get away from.

Shea Garfield

Details

Created on Wednesday, 08 October 2014 03:23

Nicotine absorbed from "passive vaping" is minimal and with no health implications

By Dr Farsalinos

A new study evaluating passive vaping has recently been published in the journal Environmental Research. The study evaluated nicotine levels in the house of vapers and smokers (compared to non-smokers), and measured salivary and urinary cotinine levels in non-smokers who were exposed to tobacco and electronic cigarette use at their homes. The main finding of the study was that "passive vaping" results in nicotine absorption from non-smokers non-vapers, at similar levels as those exposed to smoke from tobacco cigarettes. Those exposed to more than 7 tobacco cigarettes per day had higher cotinine levels (thus, more nicotine was absorbed through passive exposure).

First of all, there is no surprise that nicotine is released to the environment. Since there is a lot of vapor exhaled, and considering that nicotine absorption is lower compared to smoking, nicotine is probably exhaled by the user (I say probably, because we need more evidence to be certain about that). However, we should assess the health implications of exposure to nicotine at such levels.

Does it mean that passive vaping may lead to nicotine dependence?

Does it mean that nicotine is absorbed to such levels that it may cause harm to bystanders?

The answer to both questions is **NO**. Passive exposure to electronic cigarette resulted in median salivary cotinine levels of 0.24ng/ml, while in the control group (no exposure to tobacco or electronic cigarette) it was 0.05ng/ml. In smokers, levels of salivary cotinine exceed 300ng/ml, especially in smokers of >20 cigarettes per day. Therefore, the level of cotinine in "passive vapers" is approximately 1200 times lower than active smokers. The same research group measured cotinine levels in smokers few years ago, finding 146ng/ml in smokers of 15 cigarettes per day. This is 610 times higher than the levels in "passive vapers". Since cotinine is directly associated with the total amount of daily nicotine intake, and assuming that smokers of 15 cigarettes per day get 15mg of nicotine and show 146ng/ml cotinine levels, we can calculate that passive vaping leads to daily nicotine intake of 0.025mg. Such a levels is not only harmless but has absolutely no biological effect, even according to the strictest regulatory definitions.

The European Food Safety Authority (EFSA) has defined the Lowest Observed Adverse Effect Level (LOAEL) of nicotine. This limit has a TOXICOLOGICAL ENDPOINT OF HEART RATE ACCELERATION, which is wrong because heart rate acceleration does not imply any long-term adverse effect. According to the definition, NOAEL (which is a much lower level compared to LOAEL) is defined as: "***"An exposure level at which there are no statistically or biologically significant increases in the frequency or severity of adverse effects between the exposed population and its appropriate control. Some effects may be produced at this level, but they are not considered as adverse, nor precursors to adverse effects***". Thus, the definition by EFSA it is not in reality a LOAEL (or even a NOAEL), but much lower than that. The level set by EFSA was 0.008mg/kg body weight for ingestion, derived from calculations of intravenous nicotine injections, which found that administering 0.0035mg/kg body weight produced an acute acceleration in heart rate. For an average 75kg human, that is 0.26mg (10 times higher than the calculated 0.025mg/day intake from passive e-cigarette exposure).

Latest Comments

Verified: formaldehyde levels found in the NEJM study were associated with dry puff conditions. An update

The deception of measuring formaldehyde in e-cigarette aerosol: the difference between laboratory measurements and true exposure

In conclusion, the levels of nicotine absorbed from "passive vaping" are not only harmless but do not even produce any biological effect (not even heart rate acceleration). Considering the possibility that allowing e-cigarette use in public places may motivate smokers to switch to e-cigarette use, there is no scientific basis for any bans on e-cigarette use in public places.

NEWSLETTER
SIGN UP

WorldTop Ecigs

Disclaimer: all presentations in this site are personal opinions of the authors. By reading and using the information provided, you agree that we are not held responsible for your choices and you are personally responsibility for using or sharing this information. No recommendations are made for using the electronic cigarette. The site provides information on e-cigarette research, not advice on the use of e-cigarettes.

Abstract

Inhal Toxicol. 2012 Oct;24(12):850-7. doi: 10.3109/08958378.2012.724728.

Comparison of the effects of e-cigarette vapor and cigarette smoke on indoor air quality.

McAuley TR[1], Hopke PK, Zhao J, Babaian S.

Author information

Abstract

CONTEXT: Electronic cigarettes (e-cigarettes) have earned considerable attention recently as an alternative to smoking tobacco, but uncertainties about their impact on health and indoor air quality have resulted in proposals for bans on indoor e-cigarette use.

OBJECTIVE: To assess potential health impacts relating to the use of e-cigarettes, a series of studies were conducted using e-cigarettes and standard tobacco cigarettes.

METHODS AND MATERIALS: Four different high nicotine e-liquids were vaporized in two sets of experiments by generic 2-piece e-cigarettes to collect emissions and assess indoor air concentrations of common tobacco smoke by products. Tobacco cigarette smoke tests were conducted for comparison.

RESULTS: Comparisons of pollutant concentrations were made between e-cigarette vapor and tobacco smoke samples. Pollutants included VOCs, carbonyls, PAHs, nicotine, TSNAs, and glycols. From these results, risk analyses were conducted based on dilution into a 40 m^3 room and standard toxicological data. Non-cancer risk analysis revealed "No Significant Risk" of harm to human health for vapor samples from e-liquids (A-D). In contrast, for tobacco smoke most findings markedly exceeded risk limits indicating a condition of "Significant Risk" of harm to human health. With regard to cancer risk analysis, no vapor sample from e-liquids A-D exceeded the risk limit for either children or adults. The tobacco smoke sample approached the risk limits for adult exposure.

CONCLUSIONS: For all byproducts measured, electronic cigarettes produce very small exposures relative to tobacco cigarettes. The study indicates no apparent risk to human health from e-cigarette emissions based on the compounds analyzed.

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Characterization of chemicals released to the environment by electronic cigarettes use (ClearStream-AIR project): is passive vaping a reality?[3]

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Abstract

Background Electronic cigarettes (e-CIG) have been marketed as a safer alternative habit to tobacco smoking. We have developed a group of research protocols to evaluate the effects of e-CIG on human health, called ClearStream. No studies have adequately evaluated the effects of e-CIG use on the release of chemicals to the environment. The purpose of this study was to identify and quantify the chemicals released on a closed environment from the use of e-CIG (ClearStream-AIR).

Methods A 60 m^3 closed-room was used for the experiment. Two sessions were organized, the first using 5 smokers and the second using 5 users of e-CIG. Both sessions lasted 5 h. Between sessions, the room was cleaned and ventilated for 65 h. Smokers used cigarettes containing 0.6 mg of nicotine while e-CIG users used commercially available liquid (FlavourArt) with nicotine concentration of 11 mg/ml. We measured total organic carbon (TOC), toluene, xylene, carbon monoxide (CO), nitrogen oxides (NO_x), nicotine, acrolein, poly-aromatic hydrocarbons (PAHs) glycerin and propylene glycol levels on the air of the room.

Results During the smoking session, 19 cigarettes were smoked, administering 11.4 mg of nicotine (according to cigarette pack information). During the e-CIG session, 1.6 ml of liquid was consumed, administering 17.6 mg of nicotine. During the smoking session we found: TOC=6.66 mg/m^3, toluene=1.7 µg/m^3, xylene=0.2 µg/m^3, CO=11 mg/m^3, nicotine=34 µg/m^3, acrolein=20 µg/ml and PAH=9.4 µg/m^3. No glycerin, propylene glycol and NO_x were detected after the smoking session. During the e-CIG session we found: TOC=0.73 mg/m^3 and glycerin=72 µg/m^3. No toluene, xylene, CO, NO_x, nicotine, acrolein or PAHs were detected on room air during the e-CIG session.

Conclusions Passive vaping is expected from the use of e-CIG. However, the quality and quantity of chemicals released to the environment are by far less harmful for the human health compared to regular tobacco cigarettes. Evaporation instead of burning, absence of several harmful chemicals from the liquids and absence of sidestream smoking from the use of the e-CIG are probable reasons for the difference in results.

Introduzione

La rapida espansione, negli ultimi anni, del mercato della sigaretta elettronica, legata in parte alla possibilità di utilizzarla anche nei luoghi in cui è vietato fumare, ha fatto sorgere alcune perplessità sulla sua sicurezza in questi contesti. Ad oggi però queste perplessità si basano più su ragionamenti di tipo ipotetico che su valutazioni scientifiche. Scopo di questo esperimento, è quello di iniziare a comprendere e misurare qual è l'impatto del fumo elettronico sull'atmosfera di un ambiente chiuso, confrontandolo con il fumo tradizionale.

Protocollo

Per l'esperimento è stata predisposta una stanza, con un volume pari a circa $60\,m^3$, all'interno della quale sono stati allestiti dei sistemi di campionamento dell'aria.

Al fine di garantire una maggiore sensibilità e per rimuovere la variabile legata al ricircolo d'aria, l'esperimento è stato condotto in un ambiente senza rinnovo d'aria esterna.

I parametri analizzati sono stati:

- CO
- NO_x
- Acroleina
- Idrocarburi Policiclici Aromatici (IPA)
- Carbonio Organico Totale (COT)
- Sostanze Organiche Volatili (SOV)
- Nicotina
- Glicerina
- Glicole Propilenico

Alcuni di questi parametri (CO, NO_x, COT) sono stati monitorati in continuo. Per tutti gli altri sono state impiegate delle fiale e delle membrane specifiche per catturare le varie famiglie di composti in esame in modo cumulativo.

Procedura

L'esperimento si è svolto in 2 sessioni, una per i fumatori ed una per i *vaper*[1], della durata di 5 h ciascuna ed ha coinvolto, per ogni sessione, 5 volontari.

[1] Termine anglosassone gergale, utilizzato per indicare un utilizzatore abituale di sigaretta elettronica.

Introduction

The rapid expansion of the e-cigarette market in recent years, due in part to the fact that they can be used also in no smoking areas, has given rise to perplexities on their safety in these contexts. However, thus far, these perplexities are based more on hypothetical reasons rather than scientific evaluations. The aim of this experiment is to understand and to measure what kind of impact e-cigarettes use has on a closed environment atmosphere compared to traditional cigarette smoking.

Protocol

A $60\,m^3$ volume room was used for the experiment. This room was fitted with air sampling systems.

In order to guarantee a higher sensitivity and remove air recirculation-dependant variables, the experiment was performed without renewal of indoor air.

The following parameters were analyzed:

- CO
- NO_x
- Acrolein
- Polycyclic Aromatic Hydrocarbons (PAHs).
- Total Organic Carbon (TOC)
- Volatile Organic Compounds (VOCs)
- Nicotine
- Glycerine
- Propylene Glycol

Some of these parameters (CO, NO_x, TOC) were monitored continuously. For all the other parameters, in order to capture the various types of compounds cumulatively, vials and specific membranes were used.

Procedures

The experiment was divided in two sessions: one for vapers[1] and one for smokers. Each session lasted 5 h and involved 5 volunteers.

Between the sessions the room was cleaned and ventilated for 65 h, in order to restore the original

[1] English slang term indicating an electronic cigarette user.

Tra le due sessioni la stanza è stata pulita ed arieggiata per complessive 65 h al fine di ripristinare le condizioni di neutralità iniziali.

Sessioni di Campionamento

Nel corso delle due prove, dopo aver allestito la stanza per il campionamento e rilevato i parametri di partenza, 5 volontari hanno fumato le loro sigarette o usato la loro personale sigaretta elettronica, a seconda della sessione in corso.

Ai volontari è stato spiegato che avrebbero potuto fumare/*svapare*[2] nelle quantità e nei tempi più adatti alle loro personali esigenze, a condizione di svolgere questa attività sempre all'interno del locale predisposto per l'esperimento.

La permanenza nel locale è stata tassativamente limitata al tempo strettamente necessario a fumare/*svapare*.

L'accesso e la permanenza nel locale sono stati consentiti ad un massimo di 3 volontari contemporaneamente.

La porta della stanza è rimasta chiusa se non per il tempo necessario ad entrare o ad uscire.

Tutti i volontari hanno firmato un consenso informato prima di prendere parte allo studio.

Per la sessione fumatori, si è provveduto ad annotare il numero di sigarette fumate, mentre per la sessione *vaper* è stato valutato il peso del liquido consumato, con una bilancia di precisione.

Volontari

I volontari fumatori avevano un età media di circa 21 anni con una storia media di 6.5 anni di fumo ed un consumo medio giornaliero di circa 17 sigarette. Il contenuto di nicotina delle sigarette fumate era pari a 0.6 mg per sigaretta. Nel corso della sessione di campionamento sono state fumate complessivamente 19 sigarette, che hanno dispensato ai fumatori circa 11.4 mg di nicotina, basandosi su quanto riportato sul pacchetto.

I *vaper* hanno dichiarato di usare la sigaretta elettronica in maniera esclusiva da circa 3 mesi (min 1, max 6) con un consumo giornaliero di liquido[3] pari a 1.5 ml e un contenuto di nicotina medio di 11 mg/ml. Tutti i volontari, hanno usato un liquido commerciale (*Heaven Juice* tradizionale) prodot-

[2]Termine gergale largamente usato, derivato dall'inglese *to vape*, ed impiegato per indicare l'azione di chi fuma una sigaretta elettronica.

[3]Tutti i liquidi per sigaretta elettronica utilizzati nell'esperimento erano del tipo *Heaven Juice Tradizionale* di FlavourArt, contenenti circa il 40% di glicerolo USP, circa il 50% di glicole propilenico USP, da 0.9% a 1.8% di nicotina USP, <1% di componente aromatica, acqua depurata, secondo quanto ricavato dalla documentazione fornita del produttore.

neutral conditions.

Sampling Sessions

For the two tests, the room was initially prepared for the sampling and analyzed for baseline conditions. Then, 5 volunteers smoked their cigarettes or e-cigarettes, depending on the session.

Volunteers were allowed to smoke/vape[2] as much as and whenever they wanted, provided that they used the room set for the experiment.

The time that volunteers spent in the room was strictly limited to smoking/vaping.

Only a maximum of 3 volunteers were allowed in the room at the same time.

The door of the room was opened only to let volunteers in or out.

Informed consent was obtained by all subjects before participating to the study.

During the smokers' session, the number of smoked cigarettes was noted down. During the vapers' session, the weight of consumed liquid, was evaluated using a precision scale.

Volunteers

The mean age of smokers was about 21 years and they were smoking on average 17 cigarettes per day for 6.5 years. The nicotine content in the smoked cigarettes was 0.6 mg per cigarette. During the sampling session, a total of 19 cigarettes were smoked which dispensed about 11.4 mg of nicotine, according to the information on cigarette packs.

Vapers declared that they had been using e-cigarettes exclusively for about 3 months (min 1, max 6), with a liquid[3] daily intake of 1.5 ml, and an average nicotine content of 11 mg/ml.

For e-cigarette users, a commercially available liquid (Heaven Juice traditional) produced by FlavourArt was used, and a commercial EGO Pulse device by Smokie's®.

During the sampling session, 1760 mg of liquid were vaporized, which is equal to 1.6 ml containing

[2]English term *to vape* indicating the act of e-smoking.

[3]Heaven Juice Traditional e-cigarette liquids by Flavour Art were used during the experiment. They contained about 40% of USP glycerol, 50% of USP propylene glycol, from 0.9% to 1.8% of USP nicotine, <1% aromatic component, purified water, according to the information provided by the producer.

Composti Analizzati Analyzed compounds	Supporto di campionamento Sampling medium	Litri campionati (teorici) Sampled liters (theoretical)	Metodo Method
Nicotina **Nicotine**	Fiala XAD-2 XAD-2 vial	600	NIOSH 2544
Glicoli - Glicerina **Glycols - Glycerine**	Filtro in fibra di vetro + fiala XAD-7 Glass fiber filter + XAD-7 vial	600	NIOSH 5523
Idrocarburi Policiclici Aromatici (IPA) **Polycyclic Aromatic Hydrocarbons (PAHs)**	Filtro in fibra di vetro + fiala XAD-2 Glass fiber filter + XAD-2 vial	600	NIOSH 5515
Acroleina **Acrolein**	Fiala di Silica gel + DPNH Silica gel vial + DPNH	60	NIOSH 2018
SOV **VOCs**	Fiala di carbone attivo Activated carbon vial	60	UNI EN 13649

Tab. 1: Metodi utilizzati per il campionamento dei composti. / Methods used for substances sampling.

to da *FlavourArt* e un dispositivo EGO Pulse di Smokie's®.

Durante la sessione di campionamento, sono stati vaporizzati 1760 mg di liquido, pari a circa 1.6 ml e contenenti circa 17.6 mg di nicotina.

Materiali e Metodi

Per le metodiche di campionamento sono state adottate diverse procedure sia della normativa UNI che NIOSH, impiegando differenti fiale SKC specifiche per i diversi componenti da ricercare. Per alcune molecole sono state utilizzate anche delle membrane filtranti in fibra di vetro o in PTFE con porosità di 0.8 µm (Tab. 1).

Ogni fiala è stata collegata ad un campionatore aspirante portatile, calibrato e impostato per aspirare uno specifico volume, in funzione della durata dell'esperimento e delle specifiche della metodica in uso.

A questi sistemi di campionamento cumulativo, sono stati affiancati, un rilevatore di CO, CO_2, NO_x, e un rilevatore di COT a ionizzazione di fiamma FID.

A fine esperimento, le fiale e le membrane sono state sigillate e trasportate presso i laboratori ABICH S.r.l.[4] per le analisi.

Risultati

Le analisi dei campioni hanno evidenziato numerose e sostanziali differenze tra fumo di sigaretta e fumo elettronico, sia in termini di impatto sulla qualità dell'aria, sia anche in termini di tossicità. (Tab. 2).

Per il campionamento sono state impiegate delle membrane in PTFE e siamo rimasti colpiti dal co-

[4]ABICH S.r.l., Verbania (VB), Italia

about 17.6 mg of nicotine.

Materials and Methods

Considering the sampling methodologies different procedures both from UNI and NIOSH have been used. Different SKC vials specific for the different components to search were used. For some molecules, also fiberglass or PTFE 0.8 µm porosity membrane filters were used (Tab. 1).

Each vial was linked with a portable suction sampler, calibrated and set to aspirate a specific volume, depending on the duration of the experiment and on the method details.

In addition to these cumulative sampling systems, a CO and CO_2 and NO_x detector and a FID flame ionization TOC detector were used.

At the end of the experiment, the vials and the membranes were sealed and taken to the ABICH S.r.l.[4] labs for the analysis.

Results

The sampling analysis underlined many and fundamental differences between cigarette smoking and e-cigarette smoking, both in terms of impact on air quality and also on toxicity. (Tab. 2).

PTFE membranes have been used for the sampling. We were surprised by the colour of the mem-

[4]ABICH S.r.l.,Verbania (VB), Italy

Parametro Parameter	Volume Campionato* [L] Sampled Volume*	Concentrazione Media* [mg/m³] Mean Concentration*	
		Sigaretta Tradizionale Traditional Cigarette	Sigaretta Elettronica Electronic Cigarette
Nicotina / Nicotine	600	0.034	< 0.001**
Glicerina / Glycerine	600	< 0.001**	0.072
Glicolene Propilenico / Propylene Glycol	600	< 0.01**	< 0.01**
Acroleina / Acrolein	60	0.020	< 0.0016**

Tempo di campionamento: 300 minuti. / Sampling time: 300 minutes.

* dati relativi alle condizioni operative di riferimento (20°C e 0.101 MPa) riprodotte dall'attrezzatura / values refer to ideal working conditions (20°C and 0.101 MPa) simulated by the equipment

** inferiore alla soglia rilevabile dalla metodica / below the instrument sensitivity

Tab. 2: Sostanze rilevate. / Detected substances.

lore assunto dalle membrane alla fine delle sessioni. Questo, pur non costituendo un dato analitico di per sé, in qualche modo ci ha dato un'idea dei risultati che avremmo ottenuto (Fig. 3 e 4).

branes at the end of the sessions. Even if this does not constitute analytic data as such, it has given us an idea of the results that we could expect (Fig. 3 and 4).

Fig. 3: Membrana in PTFE al termine della sessione di fumo tradizionale. / PTFE membrane at the end of the cigarette smoking session.

Fig. 4: Membrana in PTFE al termine della sessione di fumo elettronico. / PTFE membrane at the end of the e-cigarette session.

CO (Monossido di Carbonio) [12] Il monossido di carbonio non ha mostrato alcuna variazione con il fumo elettronico, rimanendo al di sotto dei limiti di rilevabilità dello strumento, mentre il fumo di sigaretta ha prodotto un costante incremento della sua concentrazione durante tutta la durata del campionamento, raggiungendo un picco di 11 mg/m^3, valore questo, al di sopra della soglia di legge (10 mg/m^3)[5] (Fig. 5).

Il monossido di carbonio è un gas tossico con una elevata affinità per l'emoglobina, compromettendo

CO (Carbon Monoxide) [12] The levels of carbon monoxide did not show any variation during e-cigarette smoking, remaining below the detection limits of the tool. On the contrary cigarette smoking produced a steady elevation in CO throughout the sampling period. It reached a peak of 11 mg/m^3, which is above the legal threshold (10 mg/m^3)[5] (Fig. 5).

Carbon monoxide is a toxic gas with a high affinity for haemoglobin, compromising its ability to transport oxygen. Smokers, continue to exhale out high levels of CO several hours after smoking their

[5]Decreto Legislativo 13 agosto 2010, n. 155. Attuazione della direttiva 2008/50/CE relativa alla qualità dell'aria ambiente e per un'aria più pulita in Europa.

[5]Legislative decree 13th August 2010, n.155. Application of the directive 2008/50/CE concerning the quality air in the environment for a clearer air in Europe.

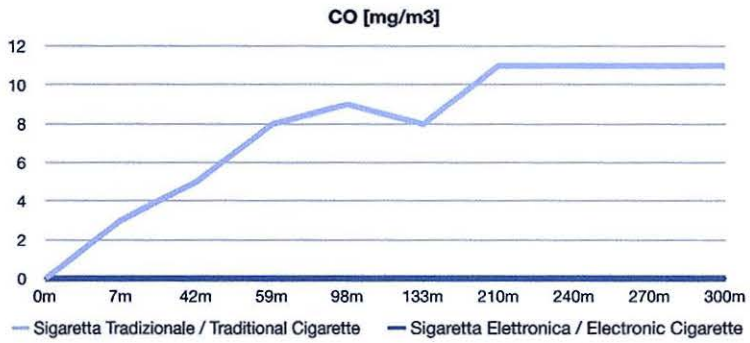


Fig. 5: Concentrazione di CO durante l'esperimento. / CO concentration during the experiment.

la sua capacità di trasportare ossigeno. Un fumatore continua ad emettere elevati livelli di monossido di carbonio, anche molte ore dopo aver fumato l'ultima sigaretta [5].

Nicotina Tra gli aspetti più interessanti, abbiamo osservato che la nicotina, pur presente nei liquidi utilizzati per l'esperimento, non è stata rilevata durante la sessione relativa al fumo elettronico. Per contro sono stati dosati 34 $\mu g/m^3$ di nicotina, con il fumo tradizionale. Va precisato che, stando a quanto riportato sui pacchetti, la quota di nicotina inalata dai fumatori, ammonta complessivamente a circa 11.4 mg, mentre i *vaper* hanno inalato nicotina per un totale di 17.6 mg. Tuttavia la quota di nicotina indicata sul pacchetto tiene conto solo della quota inalata, senza fornire alcuna informazione relativa a quella effettivamente presente nella sigaretta e liberata nell'aria durante la sua combustione.

Basandosi sui risultati osservati è possibile dedurre che il fumo di sigaretta produce una contaminazione da nicotina nell'aria, almeno 35 volte superiore a quella del fumo elettronico, il che equivale a dire che servono almeno 35 *vaper* per produrre un livello di nicotina equivalente a quello prodotto da un singolo fumatore.

Se inoltre avessimo bilanciato le prove, chiedendo ai fumatori, di consumare sigarette, in quantità tali da eguagliare il consumo di nicotina dei *vaper*, questi avrebbero dovuto fumare circa 29 sigarette, producendo una concentrazione di nicotina stimata in circa 52 $\mu g/m^3$.

Argomentare sulle ragioni di questi risultati è estremamente difficile, si potrebbe ipotizzare che esista per i *vaper* una differente cinetica di assorbimento della nicotina, o più semplicemente che le quantità in gioco siano estremamente contenute se paragonate a quelle effettivamente liberate dal fumo tradizionale. Ma al di là di queste ipotesi, tutte da verificare, il risultato in sé rimane un fatto: 5 *vaper* che utilizzano la sigaretta elettronica, per 5 h, in una last cigarette, even if the last cigarette was put out many hours before [5].

Nicotine Among all, the most interesting aspects we observed was that nicotine was not detected in air during the e-smoking session, although liquids used for experiments contained it. On the other hand, 34 $\mu g/m^3$ of nicotine were found during the smoking session. It should be made clear that, according to the information on packs, the amount of nicotine inhaled by smokers was about 11.4 mg, while the amount of nicotine inhaled by vapers was about 17.6 mg. However the amount of nicotine reported on packs is the inhaled amount. This information does not give details about the real amount of nicotine inside the cigarettes and released in the air during combustion and from side stream smoke.

Based on the observed results, we can conclude that cigarette smoking produces nicotine contamination in the air at least 35 times higher than e-smoking. This means that we need at least 35 vapers to produce nicotine level in air similar to the level produced by a single smoker.

Moreover if we had balanced the tests, asking cigarette smokers to consume the amount of cigarettes necessary to match the amount of nicotine used by vapers, the latter should have smoked about 29 cigarettes, producing an expected nicotine concentration of about 52 $\mu g/m^3$.

It's extremely difficult to discuss about the reasons for these results. We could suppose that there is a different absorption kinetics for nicotine. Or maybe the amount in play is extremely low, when compared to the nicotine amount released during traditional smoking. However beyond all these hypotheses, which have not been verified, there is one fact: 5 vapers using e-cigarettes for 5 h in a small room without renewal of indoor air do not produce detectable levels of nicotine in the air.

Parametro Parameter	Volume Campionato* [L] Sampled Volume*	Concentrazione Media* [µg/m³] Mean Concentration*	
		Sigaretta Tradizionale Traditional Cigarette	Sigaretta Elettronica Electronic Cigarette
Metiletilchetone / Methylethylketone	60	4.2	4.4
1-etil-3-metil benzene / 1-ethyl-3-methylbenzene	60	0.2	3.4
Limonene / Limonene	60	12.5	0.1
Decano / Decane	60	0.4	4.2
Undecano / Undecane	60	4.2	0.7
Dodecano / Dodecane	60	3.7	0.3
Cedrene / Cedrene	60	0.3	0.9
Longifolene / Longifolen	60	18.3	30.3
Toluene / Toluene	60	1.7	-
O,m,p – Xilene / o,m,p – Xylene	60	0.2	-
1-etil-2-metil benzene / 1-ethyl-2-methylbenzene	60	4.9	-
1,2,4-trimetil benzene / 1,2,4-Trimethylbenzene	60	0.3	-
Mentene / Menthene	60	0.5	-
BHT (Butilidrossitoluene / Butylhydroxytoluene)	60	-	0.4
Terpene / Terpene (u.s.)	60	-	2.3
Longiciclene / Longicyclene	60	-	2.2
Cariofillene / Caryophillene	60	-	1.0
n.i. totali / total u.s.	60	14.7	12.6

n.i. sostanza non identificabile / u.s. unidentifiable substance

Tempo di campionamento: 300 minuti. / Sampling time: 300 minutes.

* dati relativi alle condizioni operative di riferimento (20°C e 0.101 MPa) riprodotte dall'attrezzatura / values refer to ideal working conditions (20°C and 0.101 MPa) simulated by the equipment

** inferiore alla soglia rilevabile dalla metodica / below the instrument sensitivity

Tab. 6: Sostanze Organiche Volatili. / Volatile Organic Compounds.

stanza di piccole dimensioni e senza rinnovo d'aria, non producono livelli rilevabili di nicotina nell'aria.

Glicole Propilenico Altro parametro inatteso è il glicole propilenico, che non è stato rilevato durante la prova con il fumo elettronico, pur costituendo il 50% del liquido[3].

Questo curioso fenomeno è stato osservato anche in un altro studio simile [11]. Anche questo studio non ha rilevato nicotina nel vapore passivo di una stanza sperimentale (significativamente più piccola della stanza da noi utilizzata). Alcuni esperimenti suggeriscono che l'assorbimento del glicole propilenico per via inalatoria sia estremamente rapido [17] e questo potrebbe spiegare perché questa molecola pur così abbondante non è stata rilevata.

Glicerina e Acroleina Non è stata rilevata glicerina relativamente al fumo di sigaretta, mentre ne è stata rilevata una traccia con il fumo elettronico, pari a 72 µg, valore molto al di sotto della soglia di

Propylene Glycol Results on propylene glycol were also unexpected. During e-smoking tests, propylene glycol was not detected, although 50% of liquid[3] consisted of propylene glycol.

This curious phenomenon has also been observed in a similar study [11]. Even in that case, nicotine was not detected in an experimental room of the passive vaping (which was significantly smaller than the room we used). Some studies suggest that propylene glycol absorption via inhalation is extremely rapid [17]. This could explain why this molecule has not been detected even though it was present in significant amounts in the liquid used.

Glycerine and Acrolein No glycerine was detected in air during cigarette smoking. On the other hand, 72 µg/m³ were detected during e-smoking. This amount is much lower than the threshold safety

Parametro Parameter	Volume Campionato* [L] Sampled Volume*	Concentrazione Media* [µg/m³] Mean Concentration*	
		Sigaretta Tradizionale Traditional Cigarette	Sigaretta Elettronica Electronic Cigarette
Naftalene / Naphthalene	600	**2.78**	< 0.02**
Acenaftilene / Acenaphthylene	600	< 0.02**	< 0.02**
Acenaftene / Acenaphthene	600	**0.19**	< 0.03**
Fluorene / Fluorene	600	**0.47**	< 0.06**
Fenantrene / Phenanthrene	600	**0.37**	< 0.08**
Antracene / Anthracene	600	< 0.04**	< 0.04**
Fluorantene / Fluoranthene	600	**0.13**	< 0.02**
Pirene / Pyrene	600	< 0.01**	< 0.01**
Benzo(a)antracene / Benzo(a)anthracene	600	< 0.16**	< 0.16**
Crisene / Chrysene	600	**5.46**	< 0.14**
Benzo(b)fluorantene / Benzo(b)fluoranthene	600	< 0.33**	< 0.33**
Benzo(k)fluorantene / Benzo(k)fluoranthene	600	< 0.74**	< 0.74**
Benzo(a)pirene / Benzo(a)pyrene	600	< 0.62**	< 0.62**
Indeno(1,2,3-cd)pirene / Indeno(1,2,3-cd)pyrene	600	< 1.47**	< 1.47**
Dibenzo(a,h)antracene / Dibenzo(a,h)anthracene	600	< 1.47**	< 1.47**
Benzo(ghi)perilene / Benzo(g,h,i)perylene	600	< 1.60**	< 1.60**

Tempo di campionamento: 300 minuti. / Sampling time: 300 minutes.

* dati relativi alle condizioni operative di riferimento (20°C e 0.101 MPa) riprodotte dall'attrezzatura / values refer to ideal working conditions (20°C and 0.101 MPa) simulated by the equipment

** inferiore alla soglia rilevabile dalla metodica / below the instrument sensitivity

Tab. 7: Idrocarburi Policiclici Aromatici. / Polycyclic Aromatic Hydrocarbons.

azione (TWA-TLV 10 mg/m^3) e ben al di sotto della soglia definita di rischio moderato o irrilevante [4].

Tuttavia, bisogna rilevare che l'acroleina, molecola che si forma della disidratazione ad elevate temperature della glicerina, era presente e ben rilevabile nell'aria della stanza, durante la prova dei fumatori (20 µg/m^3).

È noto infatti che la glicerina viene spesso aggiunta ai tabacchi come umettante e durante la combustione si trasformi in acroleina [3]. L'assenza di processi di combustione nel fumo elettronico, è di fondamentale importanza per comprendere come mai l'acroleina non sia stata rilevata nell'aria durante la prova.

L'acroleina è una sostanza notoriamente molto tossica e irritante, inoltre è attualmente sospetta per avere un ruolo nei processi di cancerogenesi [1].

limit (TWA-TLV 10 mg/m^3) and much lower than the threshold for moderate risk [4].

However, it's important to note that acrolein, a molecule formed by dehydration of glycerine due to high temperatures, was present in the air of the room during cigarette smoking test (20 µg/m^3).

In fact, it is well known that glycerine is often added to moisten tobacco. During combustion glycerine is transformed into acrolein [3]. The fact that no combustion is involved when using e-cigarettes probably plays a fundamental role in the absence of acrolein from indoor air during their use.

As everyone knows, acrolein is a very toxic and irritating substance. Moreover it is currently suspected of having a fundamental role in the carcinogenic process [1].

SOV Dall'analisi delle sostanze organiche volatili, sono state evidenziate fondamentalmente componenti aromatiche, in particolare il longifolene, tipico dell'aroma di pino, era presente in entrambe le prove. È probabile che questo composto facesse parte dei prodotti detergenti o deodoranti impiegati per pulire la stanza prima dell'esperimento. In merito

VOCs During the analysis of volatile organic compounds, aromatic components were detected, in particular longifolen, typical of pine aroma, in both tests. One of the detergents used to clean the room before the test could have contained this compound. Regarding cigarette smoking, xylene and toluene were detected. These are two very common toxic

al fumo di sigaretta, si rilevano comunque tracce di xilene e toluene, due composti tossici, normalmente presenti nel fumo di sigaretta. Il limonene, terpene dell'olio essenziale di limone, è stato rilevato solo durante la prova con il fumo tradizionale ed in effetti questa molecola è stata riscontrata anche da altri studi come componente del fumo di sigaretta [11] (Tab. 6).

IPA Tra i composti più rilevanti, in termini di tossicità cronica del fumo di tabacco, ci sono certamente gli idrocarburi policiclici aromatici. Questi composti, prodotti durante il processo di combustione, sono noti per gli effetti cancerogeni e mutageni.

La prova ha identificato 6 dei 16 IPA ricercati, durante la sessione con il fumo tradizionale, mentre non è stato rilevato nulla con il fumo elettronico (Tab. 7).

COT [15] L'analisi del carbonio organico totale, non ci dà informazioni specifiche sulla tossicità. È un modo per valutare globalmente la quantità di materia organica immessa nell'aria, senza distinguere tra sostanze tossiche e non tossiche. Tuttavia questo parametro ci fornisce una visione globale del grado di contaminazione dell'aria, durante tutta la durata dell'esperimento.

Nel grafico è possibile osservare l'andamento dei livelli di COT nell'aria durante le 5 h di campionamento.

Dal grafico è stato sottratto il valore di fondo presente all'inizio del campionamento (1 mg/m^3).

Due aspetti sono interessanti a mio parere. In primo luogo i livelli massimi con il fumo di sigaretta sono oltre 9 volte più alti che con il fumo elettronico, in secondo luogo, il fumo impiega appena 11 minuti, a raggiungere il valore massimo raggiunto dalla sigaretta elettronica (0.73 mg/m^3), nel tempo di 5 h (Fig. 8).

Conclusioni

L'esperimento su descritto ha evidenziato, limitatamente ai parametri osservati, che il fumo elettronico non comporta l'immissione nell'aria di un ambiente chiuso, di sostanze tossiche o cancerogene in quantità rilevabili. Ulteriori studi sono necessari, per approfondire e meglio definire tutti gli aspetti coinvolti, ma questa valutazione preliminare suggerisce che l'impatto del fumo elettronico passivo, se confrontato con quello del fumo di sigaretta, è talmente ridotto da essere appena rilevabile e non presenta le caratteristiche di tossicità e di cancerogenicità rilevate nel fumo di sigaretta. L'assenza di combustione e la mancanza di fumo secondario (*sidestream smoke*), noto per i suoi effetti tossici [2, 6], sono probabilmen-

compounds in cigarette smoking. Limonene which is an oil lemon terpene, was detected only during the traditional smoking test. In fact this molecule was found as a component in cigarette smoke even in other studies [11] (Tab. 6).

PHAs Polycyclic aromatic hydrocarbons are, without doubt, among the most important compounds in terms of chronic toxicity caused by tobacco smoking. These substances, which are produced during the combustion process, are well known for their carcinogenic and mutagenic effects.

During the traditional cigarette smoking session, 6 out of 16 PAHs were identified. Nothing was identified during the e-cigarette session (Tab. 7).

TOC [15] The total organic carbon analysis does not give us specific information about toxicity. It is a measure of the overall amount of organic matter released in the air. There is no distinction between toxic and non-toxic substances. However this parameter gives us a global view of the degree of contamination of air, throughout the whole experiment.

The chart shows the TOC level trends in the air during the 5 h sampling.

The chart does not contain the original value of air at the beginning of the sample (1 mg/m^3).

In my opinion there are two interesting aspects which should be underlined. Firstly, the maximum levels during cigarette smoking sessions are 9 times higher than the e-smoking session. Secondly, cigarette smoking takes just 11 minutes to reach a value similar to the maximum value measured for the e-cigarette (0.73 mg/m^3), in 5 h (Fig. 8).

Conclusions

The above experiment, within the limits of the observed parameters, has underlined that e-smoking does not produce detectable amounts of toxic and carcinogenic substances in the air of an enclosed space. Further studies are needed to better understand all the involved aspects. However this preliminary assessment indicates that passive vaping impact, when compared to the traditional cigarette smoking, is so low that it is just detectable, and it does not have the toxic and carcinogenic characteristics of cigarette smoking. The absence of combustion and the lack of sidestream smoking, with its known toxic effects [2, 6] are probably the main reasons for the differences observed in air pollution characteristics

[11] T. Schripp et al. "Does e-cigarette consumption cause passive vaping?" In: *Indoor Air* (June 2012).

[12] *UNI 14626/14211, Determinazione CO e NOx / Determination of CO and NOx.*

[13] *UNI EN 1076:1999, Tubi di assorbimento mediante pompaggio per la determinazione di gas e vapori. Requisiti e metodi di prova / Absorbtion tubes by pumping for the determination of gas and vapors Requirements and test methods.*

[14] *UNI EN 1232:1999, Atmosfera nell'ambiente di lavoro. Pompe per il campionamento personale di agenti chimici. Requisiti e metodi di prova / Atmosphere in the workplace. Pumps for personal sampling of chemical agents Requirements and test methods.*

[15] *UNI EN 12619/135226, Determinazione carbonio organico totale (COT) (metodo continuo con rivelatore a ionizzazione di fiamma FID). L'utilizzo della norma UNI 12619/13526 é stato effettuato al semplice scopo di dare una valutazione sommaria dell'immissione di sostanze organiche totali in ambiente. / Determination of Total Organic Carbon (TOC) (continuous method with flame ionization detector FID). The standard UNI 12619/13526 has been used simply to give a rough estimate of the release of organic substances in the environment.*

[16] *UNI EN 13649:2002, Determinazione della concentrazione in massa di singoli composti organici in forma gassosa. Metodo mediante carboni attivi e desorbimento con solvente. / Determination of the mass concentration of each organic compound in gaseous form. Method by means of active carbons and desorption through the solvent.*

[17] M. S. Werley et al. "Non-clinical safety and pharmacokinetic evaluations of propylene glycol aerosol in Sprague-Dawley rats and Beagle dogs". In: *Toxicology* 287.1-3 (Sept. 2011), pp. 76–90.

hello i want to say thank you chairman and the members of this committee for giving me a chance to express my concern with the house bill 40

my name is benjamin nguyen i was an avid smoker since the age of 18. i am smoke free now for over two years thanks to my electronic vaporizer.

i feel that this bill will send out the a misconception about electronic cigarettes. there are way too many benefits that outweigh the cause for alarm. From reducing medical cost related to traditional cigarettes, to strengthening our low income families, with that, keeps the money circulating. Because they now have extra money to spend at local family own establishment. Just because a few rotten apples fell far from the tree, does not mean the tree itself cannot sustain life. when i say that, i mean the vaping community as a whole. sitting through these hearing i see that the biggest concern, is exposure to bystander. but a few study have been done and i will submit those documents at the end of this hearing. in these studies it shows that exposure is on the same level as ambient air. I feel that the Vaping community can govern itself. We have always spread the message in short, Vape with Consideration. To be aware of our surrounding.

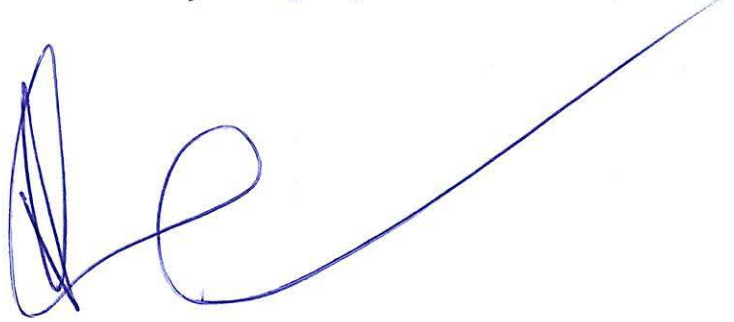
Passing this bill as is, will cause a domino effect. From taxation, from insurance company to its customer paying extra fees due to this definition and using it as leverage to force their customer into a corner. worst case scenario denying them coverage.

This industry was developed to help people break away from traditional cigarettes. to a safer alternative nicotine delivery system. We as a community do not wish to be to group together with other products like tobacco and marijuana. If this bill is intended for marijuana then it should be just that.

Passing this bill will also hurt business owners like myself, who have invested our life savings into this industries. To share our success of quitting traditional cigarettes with others. A social outlet with a positive surrounding. Where friends and families gather to unwind from a long day. Building and sustaining their inner morals for the days and weeks ahead. i even have a customer now a good friend that told me he have saved tons of money from drinking because he now has alternative place to hang out at.

Please take this all into consideration and thank you for giving me a chance to express my concern.

Benjamin Nguyen



hello and thank you for having me here today
my name is benjamin nguyen i was an avid smoker of traditional cigarettes for several years of my life.
i am smoke free for over two years now thanks for electronic vaporizer.

I oppose the House Bill 40 for several reasons.

The ingredients in ejuice are all deem safe by the FDA as "generally recognized as safe" Propylene Glycol of which is found to be use by hospital in their air filtration system documents that i will submit at the end of this hearing.

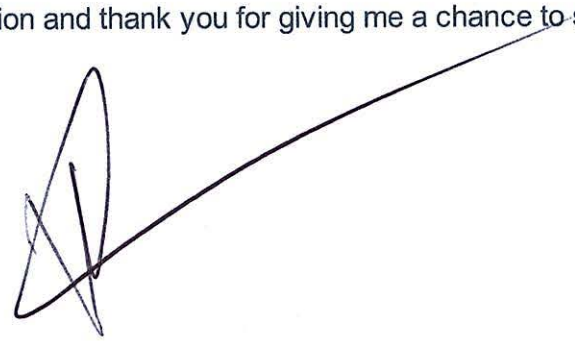
second this is an alternative nicotine delivery system,
Lets say for example asthma inhaler which has propylene glycol were to have nicotine in it also to be use as an alternative nicotine delivery system which does give off a mist of vapor when exhale quickly.
would you then include inhalers as part of this bill and the question also goes
what if the ejuice contains no nicotine, which some ejuice does not.
for those that simply vapes for the enjoyment of flavors and the fixation of muscle memories of ex smokers that we would like to call hand to mouth movement.

you see this bill is a rush job.
the definition is too broad, and too early
if this bill is intended for marijuana then it should be intended just for that.

but to include electronic vaporizers that is intended to help people quit smoking as alternative nicotine delivery system, will hurt business owner like myself that have invested life saving to this industries. passing this bill will cause a domino effect, from taxation to banning indoor vaping in businesses that is intended for it.

There is much benefits that out weights the scare in the public. From reducing medical cost associated with traditional cigarettes. To strengthening low income families that would spend $200 per person a week on traditional cigarettes to $30 a week on ejuice. money save is then spent on local business like family restaurant and other establishment. Our society is only strong as its people, we depend on.

please take all this into consideration and thank you for giving me a chance to speak here today



(4)

ANCHORAGE LEGISLATIVE INFORMATION OFFICE

Email: Anchorage.lio@akleg.gov 907-269-0111/ phone, 907-269-0229/fax

WRITTEN TESTIMONY

NAME: Jason R Jones

REPRESENTING: self

BILL#/ SUBJECT: HB40

COMMITTEE &

HEARING DATE: 3-10-15

My name is Jason Jones. I am opposed to HB40 because it includes smoke-free personal vaporizers.

I am a former smoker of 18 years, I've tried quitting numerous times and failed. Two years ago I tried using a vaporizer and haven't picked up a cigarette since. this was a turning point in my life and families. My lung capacity returned, along with my sense of smell, taste, and my overall health improved dramatically.

Vaporizers, estimated to be 99% safer than cigarettes, and according to Dr. Igor Burstyn of the Drexel University of Public Health, pose "No apparent concern to bystanders exposed to vapor."

I, now manage a Vape Shop in Anchorage because I wanted to help people switch to a much safer alternative to smoking.

(2)

ANCHORAGE LEGISLATIVE INFORMATION OFFICE

Email: Anchorage.lio@akleg.gov 907-269-0111/ phone, 907-269-0229/fax

WRITTEN TESTIMONY

NAME: Jason Jones

REPRESENTING: _____

BILL#/ SUBJECT: _____
COMMITTEE &

HEARING DATE: _____

The bill, as it is written now, would eliminate vaping in Vape Shops, which I know is essential to help people find and try the products that will help ~~people~~ them kick smoking for good.

I believe there will be negative consequences if this bill is passed, resulting in lower number of smokers turning to smoke-free alternatives.

Thank you for your time and consideration!

Jason Jones
Anchorage, AK

To whom it may concern,
My Name is Jeremy Jenkins and I'm in opposition to HB40. The use of electronic Cigarettes has allowed me to stop smoking after 20 years of smoking. I've tried quitting cold turkey, I've used the "FDA" approved Patches with no success and even the foul testing gums that I couldn't even stomach.
Electronic cigarettes is the only thing that has worked for me.
Numerous studies have been done and despite what the supporting documents for HB40 say, most of the studies provide positive conclusions to Electronic cigarette use.

Professor Igor Burstyn of Drexel University School of Public Health Studied e-liquids to determine if the chemicals in e-liquids could be dangerous. His conclusions say that there should be no concern for the passive ingestion of second hand vapor (or aerosol if you prefer). Many other studies have been done by some very reputable DRs. Scientist and chemists alike.

It seems that the only doctors, scientists Public and government agencies etc. that provide data to the negative effects of electronic cigarettes are the ones that have something to be gained from their regulation. Or getting them banned.

To use claims of harmful chemical compounds such as formaldehyde as a reason for this bill is poor at best. The Portland State chemistry professor, David Peyton that found formaldehyde in e-cigarette vapor had only tested one e-liquid from one manufacture at an unrealistic temperature setting. Dr. Konstantinos Farsalinos has already dismissed that formaldehyde study.

Even the supporting letter for this bill from The executive director of the American Lung Association in Alaska Marge Stoneking didn't provide any supporting documentation and just made empty claims.

No electronic cigarette user that I know would disrespect those around them if asked to not use it near them.

I could say much more but am unfairly only allowed two minutes for my time to oppose this bill unlike those that support it. So I will conclude again by saying I'm in oppossion to HB40.

HB 40 Testimony

My name is Justin Knight, I am 23 years old and I am 100% AGAINST House Bill Number 40. I am also a recovering drug addict who has tried very hard to cut out ALL toxic and harmful chemicals from my body. The last and hardest thing to kick was tobacco. I wouldn't have been able to stop smoking if I hadn't found vaping. It is not the same as smoking a cigarette and shouldn't be group in the same category. Vaping is more of a harm reduction product like nicotine patches and gum. Most smokers have tried both of those as well as pharmaceutical medications with little to no results. For the majority of us vaping is the only thing that has worked. When it is considered the same as smoking cigarettes it still gives people an unfair stigma and we shouldn't have to feel that way for switching to a much healthier alternative. Vaping is better for the individual, the people around us and the environment we live in giving off little to no harmful byproducts. Drug addiction is at an all time high with people dying left and right. Coming from someone who has been on that side of the street and lived with the results of it. Tax payer money and government time would be much better spent trying to solve more important issues that are killing people on a daily basis, one of which was my girlfriend back in January. She was 20 years old and died of a drug overdose. Lets stick to fixing REAL issues and let harm reduction users do their thing and shed the unnecessary stigmas. We've made a healthier choice with vaping compared to smoking Big Tobaccos Cancer Sticks that are full of THOUSANDS of toxic chemicals and we should not carry the disgusting stigma of being called a smoker. Vaping and smoking are not the same thing whatsoever.

Thank you for your time and consideration.

LIO Mat-Su

From: Matt Mcmindes <mattmcmindes@yahoo.com>
Sent: Thursday, March 12, 2015 10:48 AM
To: LIO Mat-Su
Subject: HB40 public testimony for Matthew McMindes

I am an ex-smoker. I started smoking in 8th grade, at age 13.

Smoking has caused me health problems, relationship problems, problems at work, hurt my self esteem and was a financial drain. I tried quitting several times in my life, always with little success. A friend recommended personal vaporizers, so I did some research & decided to try it. I haven't had a single cigarette since. My story is not unique, I hear it over & over.

Discouraging smoking and limiting access to tobacco products is an important and honorable goal. Tobacco products are a drain on personal finances and the public health systems. Tobacco deserves to be stopped. HOWEVER... Including personal vaporizers on this anti-smoking legislation is wrong and intellectually dishonest. Vaping is not smoking. The benefits and concerns are completely different. If you feel vaping should be regulated, regulate it. Make sure the equipment is safe and the liquids are high quality. Make sure it's not being sold to minors. But don't equate vaping with smoking. Vaping is a powerful weapon in the effort to stop the ravages of smoking and should be embraced as such rather than maligned by misinformation and mischaracterization.

Thank You,
Matthew McMindes

Most vapers spent years trying to break the smoking habit. We tried the fda approved methods. Chantix, Well Butrin, Patches, Gums and Lozenges. All of which fail miserably.

Finally, we have a product that actually works. It satisfies the hand to mouth habit as well as putting the vaper in control of how much nicotine they need. We have taken back control of our addiction.

Studies, TRUE studies that are peer reviewed without any spins have shown that there is NO harmful byproducts to second hand vapor. That bystanders are safer standing beside someone who vapes than standing beside a city bus or living in a big city. And there are several studies that shows this fact.

All of the people who vape are dumbfounded by the fact that "the powers that be" are not applauding electronic cigarettes. Instead they are imposing bans and classifying them as smoking. All vapers are proud to stand up and say, "I am not a smoker". If vaping is classified as smoking, we would like to know why? Unless, of course, a safer alternative to smoking is a threat to some groups who actually have something to gain by classifying it as smoking. Maybe a monetary reason. If that is the case, then I encourage you to not allow money to dictate your morals and standards. Please, do not classify the use of electronic cigarettes as smoking. You are demonizing those that

have chosen a healthier alternative and taken back control of our addiction.

My name is Angela Carroll and I smoked for 34 years. I have been a non smoker for 3 years. If you are interested in my health benefits, feel free to call me at 907-746-0825

Thank you for hearing what I have to say today
My name is Sheb Garfield, I am a Vaper, I manage a vape shop in Anchorage, Alaska

this bill is being backed by the Alaska Tobacco Control Alliance, Alaska Tobacco Quit Line, Dept. of Health and Human Services, among other groups. This isn't the first time i've been on opposite sides of them, until just over a year ago I was a smoker, as of Feb. 23rd I have been smoke free for a year and 2 months, previous attempts to quit using Chantix, Gum,or cold turkey never made it past the 6 month mark, and i was always wanting to have a cigarette, and fidgeting with my hands. vaping has allowed me cut nicotine intake by ¼, and satiate the hand to mouth routine that was habit for me the previous 19 years

In reading the supporting documents for hb40, sb1, and the bills we fought last year, along with over 20 years of dealing with the general public i have noticed tell tale signs that someone is spewing BS. Instead of citing a peer reviewed study and giving you a copy of that study they pick and choose results to benefit them.like the recently media hyped formaldehyde study. what they don't say is that the researchers concluded that with normal use there was no formaldehyde present, only when they applied doubled the wattage to the coil did they get negative results.

They will use descriptive words like ultrafine particles without telling you what specific particles or density, there is a huge difference between 1 PPM and 100 PPM, ultrafine particles of something deemed GRAS like VG/PG aerosol are no more harmful than normal size particles of the same substance. other words to watch out for are May, Can, Possible, all of which shows they don't have evidence to back up those statements its basicly a theory or hypothesis, and if they cite sources that use any of these its the first sign of junk science, or opinion pieces made to look like science.

There next favorite tactic is the "think of the children" just like the starving children in Africa commercials, the Anti gun lobbyists, they want to scare people with the fact that a child could try a electronic cigarette, because they are made from shiny material and have flavors like skittles, cotton candy, and fruit loops, that must be a marketing ploy to attract children because adults never eat skittles, cotton candy or fruit loops, they only want boring flavors. the fact is that as usage of any product grows, so does the amount of children/teens that try/use that product, its a numbers game, if 1 in 5000 ppl vape, most children/teens won't know what a personal vaporizer is, as that number moves towards 1 in 500, or 1 in 50, the number of children/teens that are know what they are increases and a few are going to try it. it has nothing to do with being marketed towards children/teens.

next they'll tell you its gateway to smoking, yeah sure it is,and they probably still think marijuana is a gateway drug too, why would someone who using a personal vaporizer to wean themselves off nicotine, all while tasting good and being an enjoyable hobby, switch to cigarettes that taste horrible, smell horrible, are more expensive. its the same rhetoric being spewed over and over

another argument i see a lot is Nicotine is deadly, carcinogenic, and addictive, yes nicotine can be deadly in doses, the LD50 of nicotine is 40-50 MG of pure nicotine for your average full grown adult, a high nicotine E-juice contains 18 mg per ML, which is substantially

less of a threat than the supporters of personal vaporizers being in HB40 would have you believe. Nicotine has never been classified as a carcinogen, Nicotine is also addictive but so is caffeine, chocolate, and sex, but no one wants to ban them anytime soon.

why Do I have TO Go TO a Smoke Shack and Be exposed TO sources: Second hand Smoke, after I fought so hard TO get away.

what are ultra-fine particles
http://epa.gov/ncer/nano/research/particle_index.html
ld50 and nicotine as a carcinogen:
http://www.news-medical.net/health/Nicotine-Toxicology.aspx
Personal vaporizers as a gateway
phillips debunking Glantz's gateway article
https://www.heartland.org/sites/default/files/phillips-debunking-of-glantz-gateway-working-paper-may14.pdf
impact of flavor descriptions in non smoking teens
http://ntr.oxfordjournals.org/content/early/2015/01/06/ntr.ntu333.abstract

son cannot overdose on nicotine just by smoking the
r, can occur if a person uses too many nicotine patches
ım or chewing tobacco as well as smoking.

ıto the
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yet officially listed as a carcinogen.

Related Stories

- Study suggests that strong beliefs can treat nicotine addiction
- Nicotine metabolite supports learning, memory by amplifying action of primary chemical messenger
- Extending use of bupropion before quitting reduces smoking behavior

New TAU study may offer hope to people diagnosed with Glioblastoma multiforme

Although there is no solid evidence supporting that nicotine is a carcinogen, the carcinogenic potential of the substance has been demonstrated in various animal and cell culture studies over the last ten years.

It has been shown that nicotine activates MAP kinases, increases adrenergic signalling in bowel cancer and disrupts apoptosis or programmed cell death. This cell death actually clears the body of cells that have been damaged or have undergone mutations.

Impairment of apoptosis means damaged and altered cells remain, creating a pathway for cancers to develop. Nicotine has also been shown to promote angiogensis or the formation of new blood vessels which can help a tumour to survive and grow.

Reviewed by Sally Robertson, BSc

Sources

1. www.hnehealth.nsw.gov.au/.../DOH_nicotine_fact_sheet.pdf
2. www.who.int/.../en_tfi_gender_women_addiction_nicotine.pdf
3. http://cancercontrol.cancer.gov/brp/tcrb/monographs/2/m2_4.pdf
4. tobacco.health.usyd.edu.au/assets/pdfs/tobacco-industry/atrens.pdf
5. http://teens.drugabuse.gov/sites/default/files/TG-Nicotine.pdf

Further Reading

- Nicotine - What is Nicotine?
- Nicotine Pharmacology
- Nicotine and Oxidative Stress
- Nicotine and Schizophrenia
- Nicotine Effects
- Nicotine Withdrawal

Last Updated: Dec 2, 2013

EPA United States Environmental Protection Agency

Extramural Research

Ultrafine Particle Research

EPA has been conducting research in ultrafine particulate matter, particularly in the air. Ultrafine particles are defined as those less than 100nm, so they are nano-sized. However, these ultrafine particles are not purposefully manufactured nor are they necessarily of a constant composition or size. Ultrafine particles are the result of combustion or friction processes or natural processes in the air or water. While research in ultrafine particulate matter can inform research in nanotechnology, it cannot fully address the impact of the new materials engineered for use in nanotechnology.

Grantee Research Project Results

Extramural Research Search

The US Environmental Protection Agency awarded the University of Rochester a STAR ("Science To Achieve Results") Center grant (R-827354). It provides support for one of five such centers established to study the role of airborne particulate matter, especially ultrafine particles, in causing health problems. A multidisciplinary team of experienced investigators is testing the hypothesis that ultrafine particles occurring in the urban atmosphere cause adverse health effects. Click here to learn more. EXIT Disclaimer

US EPA Particulate Matter Research Publications 1998-Present (PDF) (66 pp, 951 K) - Published in 2004, this document catalogs the publications that describe salient scientific advances in PM-related health, exposure, and implementation research conducted by ORD and EPA-funded researchers since 1998.

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The impact of flavor descriptors on nonsmoking teens' and adult smokers' interest in electronic cigarettes

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+ Author Affiliations

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Received June 30, 2014.

Abstract

Introduction:

Smokers switching completely from combustible cigarettes to e-cigarettes are likely to reduce health risk, suggesting that e-cigarettes should be made appealing to adult smokers. However, uptake of e-cigarettes by nonsmoking teens would add risk without benefit and should be avoided. Although e-cigarette flavors may appeal to adult smokers, the concern is that flavors might attract nonsmoking teens.

Methods:

Nonsmoking teens (n=216, ages 13-17, no tobacco in past 6 months) and adult smokers (n=432, ages 19-80, smoking 3+ years; could have used e-cigarettes) were recruited from an Internet research panel. In assessments completed online (May 22 to June 13, 2014), participants indicated their interest (0-10 scale) in e-cigarettes paired with various

cigarettes and validate the assessment. Mixed models contrasted interest between teens and adults and among adults by e-cigarette history.

Results:

Nonsmoking teens' interest in e-cigarettes was very low (mean 0.41±0.14[SE] on 0-10 scale). Adult smokers' interest (1.73±0.10), while modest, was significantly higher overall ($p<0.0001$) and for each flavor (most p-values<0.0001). Teen interest did not vary by flavor ($p=0.75$), but adult interest did ($p<0.0001$). Past-30-day adult e-cigarette users had the greatest interest in e-cigarettes, and their interest was most affected by flavor. Adults who never tried e-cigarettes had the lowest interest, yet still higher than nonsmoking teens' interest ($p<0.0001$).

Conclusion:

The e-cigarette flavors tested appealed more to adult smokers than to nonsmoking teens, but interest in flavors was low for both groups.

Reports of an e-cigarette gateway to cigarettes by Glantz et al.: the study results provide no support for the conclusions

Carl V. Phillips, MPP PhD
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May 2014

WORKING PAPER VERSION – COMMENTS WELCOME
(a minor variation is currently under review)

Abstract
The "gateway" claim, that use of low-risk tobacco products causes would-be nonsmokers to start smoking, is increasingly being invoked in policy discussions. However, the evidence cited as supporting this claim does not distinguish between this claim and competing hypotheses that observed associations are caused by confounding or by smokers attempting to employ tobacco harm reduction. Two recent papers by Glantz and colleagues are claimed by the authors to demonstrate a gateway effect of e-cigarettes causing smoking among youth. The present analysis demonstrates that this conclusion and others drawn by the authors are not supported by their results.

Introduction
The exploding popularity of electronic cigarettes (e-cigarettes) is the most important tobacco use phenomenon in decades. Switching to e-cigarettes is widely credited as an effective method of smoking cessation for those who have found other methods unacceptable, or who have merely not reached the point of deciding to quit. However, there is aggressive opposition to the existence of e-cigarettes, as there has been to other low-risk alternatives to smoking for decades. This opposition frequently involves assertions of unsupported claims, including in the pages of academic journals, which calls into question the integrity of such forums and the trust placed in them. Among those claims is the suggestion that low-risk tobacco products are a gateway to smoking.

The "gateway effect" refers to a pattern of drug use or other behaviors where one behavioral choice causes another. Usually the first behavior is relatively innocuous or even completely harmless in itself, but the other behavior it causes is harmful, and therefore the innocuous behavior is actually harmful if all its effects are considered. The concept had its major debut in the 20th century drug wars, with the (unsubstantiated) claim that cannabis use is much more harmful than the relatively minor physical and social effects of the drug because it causes "hard drug" use (Tony Newman and Shayna Samuels) (Degenhardt et al. 84-97;Morral, McCaffrey, and Paddock 1493-504) [http://www.drugpolicy.org/news/2002/12/marijuana-gateway-theory-discredited].

It is important to recognize that gateway claims are about *causation*, even if they avoid that word – i.e., that the more harmful behavior would not have occurred but for the less

harmful precursor. While sometimes the language is that of mere ordering, the discussion about how reducing one exposure would reduce the other is a causal claim. The literal interpretation of the metaphor – that the first behavior is merely a portal on the way to a goal – is clearly not intended.

Over the last 15 years, the gateway claim has been made about low-risk tobacco products leading to the use of cigarettes, often by influential individuals or institutions (e.g., (Richard H.Carmona)[http://www.surgeongeneral.gov/news/testimony/tobacco06032003.html (U.S.Department of Health and Human Services)http://www.cdc.gov/media/releases/2013/p0905-ecigarette-use.html (Most youth who use smokeless tobacco are smokers, too)http://www.foxnews.com/health/2013/08/09/most-youth-who-use-smokeless-tobacco-are-smokers-too/ http://www.clivebates.com/?p=2013#more-2013 (Electronic Cigarettes – An Overview)http://www.dkfz.de/en/presse/download/RS-Vol19-E-Cigarettes-EN.pdf]. The low-risk alternatives, including smokeless tobacco and electronic cigarettes (e-cigarettes), provide smokers with an option of reducing their risks almost as much as quitting tobacco entirely, but without giving up all the benefits of tobacco, a practice known as tobacco harm reduction (THR). Among the most-repeated claims about why these products are not really low risk and why THR should not be promoted is the gateway claim that they cause initiation of smoking.

Such claims have important real-world implications. They influence the popular discourse and are used to justify policies to place burdens on the availability or use of low-risk tobacco products. This includes not only policies that would tend to reduce a gateway effect if it existed (e.g., banning the low-risk product), but also those that would not seem to change the magnitude of any gateway effect (e.g., discouraging smokers from pursuing THR; bans on using e-cigarettes where smoking is prohibited). Moreover, the gateway effect is invoked to support even those restrictions that would actually increase the appeal of switching to smoking (e.g., imposing punitive taxes on the low-risk products, capping their nicotine content, or restricting their flavors) and would thus *increase* any gateway effect. But whatever flaws might exist in the logic of how gateway claims are invoked to influence policy, there is little doubt that they are influencing it.

There is relatively little attention to whether gateway behavior is even plausible for tobacco products, despite analytic arguments that it is very unlikely to happen (Carl V.Phillips)[http://antithrlies.com/2014/01/11/draft-regulatory-science-white-paper-2-the-gateway-effect/]. The scientific and public discussions instead engage in theory-free appeals to empirical results. However, the empirical studies that are purported to show a gateway effect (e.g., (Tomar SL. 561-69)[http://www.ncbi.nlm.nih.gov/pubmed/12959794, (Haddock CK et al. 262-67)http://www.ncbi.nlm.nih.gov/pubmed/11277684, (Bertrand Dautzenberg et al. 21-24)http://www.scirp.org/journal/PaperInformation.aspx?PaperID=28003]) provide little or no support for the conclusions because the evidence does nothing to distinguish between the causal claim and other explanations for observed associations.

Discussions about causal inference in epidemiology frequently invoke non-existent "criteria" for determining causation and similarly baseless claims about a hierarchy of study types. Overlooked is the most fundament scientific consideration about causal inference: Does the observed data provide better support for the causal claim than it does for competing plausible hypotheses?

For the smoking gateway claim, there are two compelling alternative explanations for why we observe an association between low-risk product use and smoking. One is reverse causation: Smoking is causing the low-risk product use. This clearly explains some of the association when the low-risk products are being widely used for smoking cessation, as is evidenced by testimonials or other data that includes assessments of the causation (people's reports of their motives) that are absent from data on behavior alone. Since e-cigarettes are used almost exclusively to quit or reduce smoking, and smokeless tobacco also in some populations (Karl E.Lund, Janne Scheffels, and Ann McNeill 162-67)[http://onlinelibrary.wiley.com/doi/10.1111/j.1360-0443.2010.03122.x/abstract;jsessionid=AE583B9F4280E722073110F3DAA0266D.d01t03, (J Foulds et al. 349-59)http://tobaccocontrol.bmj.com/content/12/4/349.full], this alone will cause an association of the behaviors. Data about temporality, such as from retrospective questions (e.g., "How long have you smoked?" "When did you first try an e-cigarette?") can help distinguish between the gateway and THR hypotheses, though there are challenges in making such interpretations. For example, past use of one product does not rule out the possibility that the other product caused the current pattern of use. More direct questions, asking product users about how use of one affected the use of another, are more promising.

Temporality does nothing to address the other plausible competing hypothesis: People who are attracted to the use of one tobacco product are far more likely to be attracted to another, as compared to people who are not attracted to any tobacco product in the first place. This would be caused primarily by an appreciation of nicotine but could also be affected by a willingness or desire to defy social norms. This confounding is obviously the cause of large portion of the association between smoking and e-cigarette use in any population. Confounding is always a challenge for causal inference from non-experimental data, and relevant data about tobacco and other drug use is necessarily non-experimental There is such overwhelming confounding that it is difficult to imagine it can be "controlled for" using standard epidemiologic methods, though attempts to do so have found that the associations cited as demonstrating the gateway effect disappear (O'Connor et al. 535-43)[http://www.ncbi.nlm.nih.gov/pubmed/12959791]. A propensity score approach is somewhat more promising, and has been used to show that the associations interpreted as gateway effects disappear (Timberlake, Huh, and Lakon 455-62)[http://www.ncbi.nlm.nih.gov/pubmed/19307445]. Propensity-based modeling has been used to show that observed associations across drug categories can be explained by this confounding (Morral, McCaffrey, and Paddock 1493-504)

Recently, two studies by Glantz and colleagues, "Electronic Cigarettes and Conventional Cigarette Use Among US Adolescents; A Cross-sectional Study" by Dutra and Glantz (Dutra LM and Glantz

SA)[http://archpedi.jamanetwork.com/article.aspx?articleid=1840772], and "Electronic Cigarette Use Among Korean Adolescents: A Cross-Sectional Study of Market Penetration, Dual Use, and Relationship to Quit Attempts and Former Smoking", by Lee, Grana, and Glantz (Lee S, Grana RA, and Glantz SA.)[http://www.ncbi.nlm.nih.gov/pubmed/24274973], were declared, by the authors and other commentators, to show that e-cigarette use among teenagers is causing smoking. The following analysis shows that their study results do nothing to favor this explanation over either of the competing explanations.

Analysis

Study methods

The two studies are quite similar, and thus the same analysis applies to both. Dutra-Glantz uses the 2011-2012 U.S. National Youth Tobacco Survey (NYTS). Lee-Grana-Glantz uses the 2011 Korean Youth Risk Behavior Web-based Survey. Both are cross-sectional studies of middle-school and high-school age populations that include data about smoking and e-cigarette use. NYTS contains some temporal data, but Dutra-Glantz did not consider it in their analysis; it contains no self-reporting of how use of one products influence the choice to use another. No data about either of these was reported by Lee-Grana-Glanz. The reported statistics include no controlling for confounding.

The authors' claims

The authors' main conclusions for Dutra-Glantz:

> "Use of e-cigarettes does not discourage, and may encourage, conventional cigarette use among US adolescents." (from the abstract)
>
> "E-cigarettes are likely to be gateway devices for nicotine addiction among youth, opening up a whole new market for tobacco" (from the authors' press release (Elizabeth Fernandez)[http://www.ucsf.edu/news/2014/03/112316/e-cigarettes-gateway-nicotine-addiction-us-teens-says-ucsf-study])

for Lee-Grana-Glantz:

> "Adolescents who tried to quit smoking are more likely to use e-cigarettes but less likely to no longer smoke, which suggests that e-cigarettes inhibit rather than promote cessation." (from the Implications and Contributions sidebar)

for both:

> "In combination, the two studies suggest that 'e-cigarettes may contribute to nicotine addiction and are unlikely to discourage conventional cigarette smoking among youths,' said the scientists." (From the Dutra-Glantz press release)

Note that what the authors call "use" is really trialing, further compounding the misleading nature of the conclusions.

Study results

The main results for the studies are as follows, quoting all the multivariate results from the abstracts (with parentheticals and quantifications omitted for clarity; the authors made no reference to the magnitude of associations in drawing their conclusions). The abstracts presumably reflect the authors' own beliefs about the evidence that best supports their claims, and a review of the text finds no other stated results that would tend to bolster their claims. Because the present exercise is to demonstrate that the conclusions do not even follow from the stated results, no attempt has been made at forensic examination of the accuracy of the claimed results or methodology choices, nor to provide additional results from the data that the authors chose not to report. It is possible that forensic examination of the analytic choices made by the authors (e.g., the odd choice of definition for "current smoker" by Glantz-Dutra (Rodu B.)[http://rodutobaccotruth.blogspot.com/2014/04/ucsf-redefines-youth-smoking-journals.html]) could challenge the reported results themselves.

Points 1-6 are the abstract results from Dutra-Glantz. The category terms they use are non-intuitive and internally inconsistent, so it is important to attend to their definitions: "cigarette experimenter" means took one puff ever; "ever e-cigarette user" means took one puff ever; "ever smoker" means cumulatively smoked at least 100 cigarettes ever; "current smoker" means cumulative consumption of 100 cigarettes plus took at least one puff in the last 30 days; "current e-cigarette use" means took one puff in the last 30 days; "abstinence" refers to not smoking a cigarette within the specified period.

1. Among cigarette experimenters, ever e-cigarette use was associated with higher odds of ever smoking cigarettes and current cigarette smoking.
2. Current e-cigarette use was positively associated with ever smoking cigarettes and current cigarette smoking.
3. In 2011, current cigarette smokers who had ever used e-cigarettes were more likely to intend to quit smoking within the next year.
4. Among experimenters with conventional cigarettes, ever use of e-cigarettes was associated with lower 30-day, 6-month, and 1-year abstinence from cigarettes.
5. Current e-cigarette use was also associated with lower 30-day, 6-month, and 1-year abstinence.
6. Among ever smokers of cigarettes, ever e-cigarette use was negatively associated with 30-day, 6-month, and 1-year abstinence from conventional cigarettes. Current e-cigarette use was also negatively associated with 30-day, 6-month, and 1-year abstinence.

Points 7-10 are the abstract results from Lee-Grana-Glantz. The definitions of terms are not clearly presented in the paper, but can be inferred. They differ from those used in Dutra-Glantz. "Current smoker" means took one puff in the last 30 days (the more standard definition in the literature, though still not the intuitive meaning of the phrase); "e-cigarette user" apparently means took one puff ever; "current e-cigarette user" means took one puff in the last 30 days.

7. After adjusting for demographics, current cigarette smokers were much more likely to use e-cigarettes than were nonsmokers.
8. Among current cigarette smokers, those who smoked more frequently were more likely to be current e-cigarette users.
9. The odds of being an e-cigarette user were...higher among students who had made an attempt to quit than for those who had not.
10. It was rare for students no longer using cigarettes to be among current e-cigarette users.

Alternative hypotheses

To illustrate the extent to which the stated conclusions are not supported by the results consider extreme versions of the two alternative hypotheses; these contradict the gateway hypothesis and thus the stated conclusions:

Scenario 1: There is no causation in either direction between e-cigarette use and smoking, but there are common causes. Under this scenario, the common causes are not merely a major contributor to the association, but account for all of it. Glantz et al. ignore confounding; they give no indication they understand its importance and indeed do not even use the word.

Scenario 2: E-cigarette use never causes smoking in these populations, and a large portion of e-cigarette use consists of attempted THR. That is, the causal relationship between smoking and e-cigarette use flows entirely in the direction that Glantz et al. seek to deny is occurring, and not at all in the direction claimed. This scenario can even be extended to the extreme that any non-smoker who adopts e-cigarette use (if there are any such – recall that the data is just about trialing, not using) does so as a substitute for would-be smoking, though this is not necessary. Without loss of generality, the hypothesis could also be that *much* e-cigarette use is caused by smoking and no smoking is caused by e-cigarette use (i.e., there is also confounding).

If one of these extreme scenarios are compatible with the empirical results, then so is a more realistic less extreme version or hybrid. In particular, keep in mind the following hybrid: "Most of the association is due to the confounding, but there is some affirmative evidence of THR; it is possible that there are some gateway cases, but there is no affirmative evidence to support that."

Which hypotheses are supported?

Under all three hypotheses, results 1, 2, 7, and 8 would obviously be inevitable, and so they offer no discrimination. (To the extent that 8 is less obvious, it can be added to the next group.)

Results 4, 5, 6, and 9 are presumably the authors' main basis for their declarations that there is a gateway effect. While perhaps not so obvious as the previous four, these too are fully compatible with the alternative hypothesis. The effects of confounding by common causes inevitably have magnitude and not just direction (i.e., it is not merely the case that there are common causes that make use of both products more likely, but that

the more intense these causal factors are, the more likely use of each product is). Thus, for individuals with high levels of the common cause factors, like wanting to consume nicotine, the more likely non-abstinence from smoking is (due to the confounding cause) and the more likely use of other tobacco products is. Thus these results would be inevitable under Scenario 1.

These results would also be predicted under Scenario 2. Smokers who want to quit and are happy to be abstinent simply quit (which is why unaided quitting is responsible for most successful smoking cessation). This alone means that pursuit of THR will skew toward those who find quitting more unappealing, and thus are less likely to quit over any short period. If THR always consisted of immediate complete switching, we would expect different results But we know that THR frequently involves a transition period, even among adults who adopt it aggressively. Bear in mind that the study subjects were young, and so all their behavior could be considered transitional. This is further compounded by the calendar time of these surveys, with e-cigarette use being novel in the population. Thus more of those who will eventually switch would still be transitioning as compared to a future older population where e-cigarette trialers have had ample time to complete the transition. Additionally, to the extent that dedicated smokers among the subjects were using e-cigarettes as a THR substitute to cut down on smoking, but who did not seek to give up taking an occasional puff on a cigarette, these are the results we would expect. A former heavy smoker who successfully employed THR to cut down to one cigarette a month would contribute to the observed associations. Thus, results 4, 5, 6, and 9 serve only as evidence against a straw man version of THR (that complete switching always occurs immediately), but provide little discrimination among the three hypotheses.

The same observations apply to result 10, though it requires a bit more unpacking. The empirical result is not actually what is stated in the prose, but rather is properly described as "e-cigarette use was much more likely among subjects who had puffed a cigarette in the last 30 days as compared to those who had puffed a cigarette at least once, but not in the last 30 days." Once it is phrased accurately, it is clear the observation fits perfectly with the observations about results 4, 5, 6, and 9: It is the inevitable result of common causes (those who tried a cigarette but did not like it would be unlikely to use e-cigarettes) as well as THR attempts (those who long ago stopped smoking would have no reason to pursue THR). As for the "rare" claim, this is obviously technically true, since e-cigarette use in general was rare in this population, but the claim as stated is misleading. The authors could have reported what portion of current e-cigarette users were former smokers (they reported many similar statistics in Table 2), but did not.

Finally, result 3 provides evidence that favors Scenario 2 (or a less extreme hypothesis about THR, like the hybrid example that was offered) over the other hypotheses. This is true also for the similar result in Lee-Grana-Glantz, which was omitted from the abstract though it is mentioned in the conclusions section and press release, and presented as part of the same sentence in the text that contained abstract result 10: "Although attempt [sic] to quit smoking conventional cigarettes was associated with current e-cigarette use...." These observations are not incompatible with the gateway hypothesis or Scenario 1, but

they would not be actively predicted by them; an all-gateway or all-confounding scenario would not be expected to find this association.

In summary, there is very little in the empirical results that discriminates among the hypothesis that the authors declared to be true (gateway), the one they declared to be false (THR), and the one they seem unaware of (confounding). To the extent that there is any discrimination from the results among the three extreme scenarios, it favors the THR hypothesis. Background knowledge tells us that confounding is a likely explanation for most of the observed association even in the presences of causation (that is, the extreme version of either of the other hypotheses not plausible). But result 3 still provides active support to conclude that THR is occurring. There is nothing at all in the results that tends to support the hypothesis that there is a gateway effect over the competing hypotheses.

It should be noted that the most frequently cited claim for why the conclusions from these studies do not follow from the results – that cross-sectional data cannot demonstrate temporal ordering of trying cigarettes vs. trying e-cigarettes – is incorrect. This error may be the result of the red herring claim in each paper's statements of study limitations (which omit any reference to confounding or alternative causal hypotheses), citing the cross-sectional data as the main limitation. This claim is wrong at two levels. First, cross-sectional surveys can and often do measure temporal ordering of behaviors; they just need to ask the right questions (e.g., "Which tobacco product did you use first?"). Indeed, the NYTS includes data that could show, albeit imperfectly, that most subjects tried a cigarette before they tried an e-cigarette. Second, knowing temporality is neither necessary nor sufficient for establishing causation. The mere precedence of one behavior obviously does not mean it caused a later behavior, even if they are associated. Moreover, someone trying a cigarette first does not rule out the gateway effect, because use of e-cigarettes still could have caused her to become a smoker. Smoking, not trialing, is the outcome of interest, and it can be caused by an event subsequent to initial trialing. The reason the conclusions do not follow from the results is that contrary hypotheses are equally or more compatible with the results, not the lack of temporality data.

<u>Other claims that do not follow from the data</u>
Several ancillary conclusions stated by the authors would be unsupported even if the data supported the main conclusions:

> Some Korean adolescents may be responding to advertising claims that e-cigarettes are a cessation aid (from the Lee-Grana-Glantz abstract)

There is no reported data, nor any analysis, that addresses whether the subjects are responding to advertising claims.

> "We are witnessing the beginning of a new phase of the nicotine epidemic and a new route to nicotine addiction for kids," according to senior author Stanton A. Glantz, PhD, UCSF professor of medicine and director of the Center for Tobacco Control Research and Education at UCSF. (from the Lee-Grana-Glantz press release (Elizabeth

Fernandez)[http://www.ucsf.edu/news/2013/11/110416/electronic-cigarettes-new-route-smoking-addiction-adolescents])

There is nothing in the study that assesses addiction, let alone evidence that e-cigarettes cause it (even setting aside the ambiguity about what that would mean). The main results show that e-cigarettes are mostly a *redundant* route to nicotine use. They are a "new route" only in the sense that each new production batch of cigarettes is a new route; in both cases, they are used mostly by the same people who were consuming the product that existed prior to that.

> "Our paper raises serious concern about the effects of the Wild West marketing of e-cigarettes on youth," said Glantz. (ibid)

The paper provides no information about marketing or its effects.

> Sungkyu Lee, PhD, lead author of the paper and a UCSF postdoctoral fellow at the time that he conducted the study, noted that e-cigarette use has skyrocketed in Korea: less than 1 percent of youths had tried the product in 2008 when the device was first introduced, compared to more than 9 percent in 2011. (ibid)

It is difficult to imagine how there could not be a substantial increase in lifetime ever-trialing rates, measured in relative terms, when the baseline is "when the product was first introduced". This might be the source of concern referred to in the previous quote, but is unrelated to what appears in the article.

> "It looks to me like the wild west marketing of e-cigarettes is not only encouraging youth to smoke them, but also it is promoting regular cigarette smoking among youth," said senior author Stanton A. Glantz, PhD, UCSF professor of medicine and director of the Center for Tobacco Control Research and Education. (from the Dutra-Glantz press release)

There is nothing in that study about marketing, let alone demonstrating its effects (there is one unsupported assertion in the introduction and no further mention). The unrelated second half of the sentence is, of course, the gateway claim that is debunked above.

And finally,

> "Despite claims that e-cigarettes are helping people quit smoking, we found that e-cigarettes were associated with more, not less, cigarette smoking among adolescents," said lead author Lauren Dutra, a postdoctoral fellow at the UCSF Center for Tobacco Control Research and Education. (ibid)

This is a restatement of the authors' main claim, concisely phrased so that it should be obvious to the speaker and everyone else that the claim is unsupported. Contrary to the implied logic, if e-cigarettes are used *exclusively* to quit smoking, their use obviously will be associated with smoking.

Discussion

Conclusions that do not follow from the analysis are common in peer-reviewed public health journals and are widely believed by naïve non-scientists. Much of this results from nothing more complicated than misplaced trust. The scientific process trusts authors to be honest, making it very easy for those whose goals diverge from furthering scientific understanding to game the system. The only checks on this are journal editors and reviewers (there are no checks on press releases), but they are frequently inattentive, making acceptance of a paper with erroneous conclusion no worse than a dice roll for the authors. Moreover, gatekeepers who share the authors' political goals can be intentionally selected, and no one *custodiet ipsos custodes*.

A deeper understanding of the failure of public health analyses comes from recognizing the importance of implicit theorizing. Data and statistics never "speak for themselves" and conclusions from them are always based on a host of ancillary beliefs. Thorough scientists state their most important ancillary theories explicitly, but in public health science they are seldom stated and often apparently not even recognized by the authors. In many cases, if the key implicit theories were even vaguely explained by the authors – perhaps if journals forced them to do it – they would be immediately recognized as problematic.

In the present case and many like it, the authors seem to be operating under a theory that might be called a faith-based Bayesianism: Their prior probabilities for one particular hypothesis (that e-cigarettes cause smoking) are extremely high, at a level that rivals religious belief, as suggested by Glantz's statements [e.g., (Tavernise)[http://www.nytimes.com/2014/02/23/health/a-hot-debate-over-e-cigarettes-as-a-path-to-tobacco-or-from-it.html?emc=edit_tnt_20140222&tntemail0=y, (Glantz SA)https://tobacco.ucsf.edu/more-evidence-big-tobacco-harm-reduction-efforts-are-designed-protect-cigarette-sales,]. Their prior probability that e-cigarettes are used for THR are comparably low (again, supported by previous writings [https://tobacco.ucsf.edu/more-evidence-ecigarettes-are-not-reducing-smoking, http://www.tobacco.ucsf.edu/more-evidence-e-cigs-inhibit-quitting-conventional-cigs-real-world]) as is the probability that co-use is simply caused by personal preference (there is no evidence in the papers, and none apparent in Glantz's other writings, that they are even aware of this possibility). While the authors reported frequentist statistics, their conclusions are all phrased in terms of worldly probabilities (i.e., are Bayesian). In the presence of these ancillary assumptions, *any* empirical evidence that does not flatly rule-out the gateway hypothesis (and it is difficult to imagine what would), no matter that it is more compatible with a competing hypothesis, will leave the authors with a high posterior probability for their favored claim.

To illustrate, consider an example of updating of Bayesian priors. Consider someone whose prior beliefs are that there is a 50% chance that e-cigarettes cause smoking, a 1% chance that e-cigarettes are used for THR, a 1% chance that there is a strong association caused by confound, with the remaining probability that there is no association. (This is

obviously a simplified example, based on the extreme pure hypotheses, but it serves to illustrate.) Further assume the beliefs that there is an 80% probability a study will show an association (again simplified – the magnitude matters) under the first three hypotheses and a 5% chance under the last. The posterior probabilities, applying the Bayes Theorem after the observation of association, would be .91, .02, .02, and .05, which is strong support for the first hypothesis. But, of course, the observation increased the probabilities of all of the first three hypotheses by the same ratio, at the expense of the fourth, and so the overwhelming support for the first compared to the second and third is just an echo of the prior beliefs.

Note that this is the most charitable interpretation of the conclusions. Offering such an explanation does not rule out the alternative interpretation that the authors had no theory whatsoever, and just wrote the conclusions they politically preferred and juxtaposed them with the study results without even believing they were related. Moreover, the explicit claims by the authors that the empirical results support their conclusion, when at best they merely let them preserve their strong priors, are false regardless of the ancillary assumptions.

Those who are genuinely interested in discriminating among competing hypotheses have ways of doing so. Temporal data can be used to partially test whether gateway or THR is a more plausible conclusion (with the above caveat that it is not definitive unless the retrospective data is very rich). The confounding hypothesis can be tested using data that is rich with covariate, though not in the naïve way usually employed in epidemiology (choose one particular statistical model and pretend it "controls for" all the confounding). Rather, the researcher should examine whether the association is robust across many different multivariate models that are potentially confounding-controlled. If the association survives robust attempts to "make it go away", the plausibility of causation is support (though the direction of causation remains ambiguous). Additionally, hypothetico-deductive tests can be run (e.g., if there is a gateway, there should be certain statistical similarities across different populations (Degenhardt et al. 84-97)).

While the datasets used in these papers were not optimal for discriminating among the competing hypotheses, there are ways that they could be better used to do so. (Exploring how to better discriminate is beyond the present scope and is being pursued as a separate project.) But there is no evidence the authors even attempted this. To the extent that they did try to discriminate, they apparently failed to find any support for their preferred hypothesis because there is simply nothing in the analyses that tends to support it over the pure-confounding or almost-all-THR hypotheses where there is zero gateway effect.

Acknowledgments
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Its development benefitted from comments of CB, Brad Rodu, Igor Burstyn, and Julie Woessner. Research support was provided by CASAA; CASAA is a public health consumer-advocacy NGO whose mission includes education about low-risk alternatives to smoking and debunking disinformation about them. CVP is currently the recipient of an unrestricted research grant from British American Tobacco (which while completely unrestricted, was provided primarily to support work unrelated to the present paper). No one employed by a corporation or organization that sells any of the products referenced in the paper was offered the opportunity to comment before the material was published, nor influenced its content; similarly, no one employed by an organization dedicated to eliminating any of the products influenced the content.

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Long-term effects of inhaled nicotine.

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Tobacco smoking has been reported to be associated with increased risk of cardiovascular disease and cancer, particularly of the lungs. In spite of extensive research on the health effects of tobacco smoking, the substances in tobacco smoke exerting these negative health effects are not completely known. Nicotine is the substance giving the subjective pleasure of smoking as well as inducing addiction. For the first time we report the effect on the rat of long-term (two years) inhalation of nicotine. The rats breathed in a chamber with nicotine at a concentration giving twice the plasma concentration found in heavy smokers. Nicotine was given for 20 h a day, five days a week during a two-year period. We could not find any increase in mortality, in atherosclerosis or frequency of tumors in these rats compared with controls. Particularly, there was no microscopic or macroscopic lung tumors nor any increase in pulmonary neuroendocrine cells. Throughout the study, however, the body weight of the nicotine exposed rats was reduced as compared with controls. In conclusion, our study does not indicate any harmful effect of nicotine when given in its pure form by inhalation.

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Secondhand Exposure to Vapors From Electronic Cigarettes

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Abstract

Introduction: Electronic cigarettes (e-cigarettes) are designed to generate inhalable nicotine aerosol (vapor). When an e-cigarette user takes a puff, the nicotine solution is heated and the vapor is taken into lungs. Although no sidestream vapor is generated between puffs, some of the mainstream vapor is exhaled by e-cigarette user. The aim of this study was to evaluate the secondhand exposure to nicotine and other tobacco-related toxicants from e-cigarettes.

Materials and Methods: We measured selected airborne markers of secondhand exposure: nicotine, aerosol particles ($PM_{2.5}$), carbon monoxide, and volatile organic compounds (VOCs) in an exposure chamber. We generated e-cigarette vapor from 3 various brands of e-cigarette using a smoking machine and controlled exposure conditions. We also compared secondhand exposure with e-cigarette vapor and tobacco smoke generated by 5 dual users.

concentrations of nicotine emitted by various brands of e-cigarettes ranged from 0.82 to 6.23 μg/m^3. The average concentration of nicotine resulting from smoking tobacco cigarettes was 10 times higher than from e-cigarettes (31.60±6.91 vs. 3.32±2.49 μg/m^3, respectively; p = .0081).

Conclusions: Using an e-cigarette in indoor environments may involuntarily expose nonusers to nicotine but not to toxic tobacco-specific combustion products. More research is needed to evaluate health consequences of secondhand exposure to nicotine, especially among vulnerable populations, including children, pregnant women, and people with cardiovascular conditions.

INTRODUCTION

Passive smoking, also referred to as exposure to secondhand smoke (SHS), happens when a person inhales a mixture of toxic compounds released from burning cigarettes (California Environmental Protection Agency, 2005; [illegible]). Despite the

comprehensive smoke-free regulations introduced in many countries, passive smoking remains a global health problem. It has been estimated that passive smoking causes more than six hundred thousand deaths every year around the world (Oberg, Jaakkola, Woodward, Peruga, & Prüss-Ustün, 2011). Current laws and regulations do not adequately protect vulnerable populations, including children, pregnant women, and those with preexisting health conditions, from exposure to SHS. Based on data from 192 countries, Oberg et al. (2011) estimated that 40% of children had been exposed globally to SHS. SHS (also referred to as environmental tobacco smoke, ETS) is comprised primarily of sidestream smoke released from burning cigarettes during puff breaks and smoke exhaled by smokers after each puff. While SHS may contain the same toxic substances as mainstream smoke, it contains higher concentrations of many toxic and carcinogenic compounds than mainstream smoke. Although toxicants released from burning cigarettes are diluted in the indoor air, passive smokers are often exposed to secondhand smoke for prolonged periods of time.

Electronic nicotine delivery systems (commonly referred as electronic cigarettes or e-cigarettes) are new consumer products designed to generate nicotine aerosol (vapor) without combustion of tobacco. A typical e-cigarette is composed of three essential parts: the battery, the heating element or atomizer, and a cartridge or tank that holds a nicotine solution. The product contains nicotine dissolved in propylene glycol, glycerin, or the mixture of the two. When an e-cigarette user takes a puff, the nicotine solution is heated and the vapor can be inhaled into lungs. E-cigarettes are designed to deliver nicotine without toxic constituents of tobacco or tobacco combustion toxicants and carcinogens. Studies have shown that vapor generated from e-cigarettes contains nicotine and that the devices might be effective in delivering nicotine to the body. There is also some evidence that the vapor may contain some toxic compounds like carbonyls, traces of nitrosamines, or particles of heavy metals (Bullen et al., 2010; Dawkins & Corcoran, 2013; Etter & Bullen, 2011; Goniewicz, Knysak, et al., 2013; Goniewicz, Kuma, Gawron, Knysak, & Kosmider, 2013; Trehy et al., 2011; Vansickel & Eissenberg, 2013; Vansickel, Cobb, Weaver, [illegible]; [illegible] et al., 2013).

Analysis of global e-cigarette marketing indicates that the products are promoted to circumvent smoke-free policies and to reduce exposure to secondhand smoke (Grana & [illegible]). Although no sidestream vapor is generated from e-cigarettes between puffs, some of the vapor is exhaled by the user. A study by [illegible] (2013) showed that ultrafine particles, volatile organic compounds (VOCs), and nicotine are released with exhaled vapor. [illegible] investigated emissions and indoor air concentrations of common tobacco smoke by-products from four different vaporized nicotine solutions and found that they emitted traces of carbonyls, polyaromatic hydrocarbons, tobacco-specific nitrosamines, and glycols. There is limited evidence whether passive "vaping" exposes nonusers to nicotine. One study showed that 1-hr exposure to secondhand cigarette smoke and to exhaled "secondhand" e-cigarette vapors generated similar effects on serum cotinine levels ([illegible] et al., 2013).

As the popularity of e-cigarettes increases, it is becoming important to further investigate patterns and levels of passive exposure to nicotine and other toxicants from e-cigarettes. The present study explores various factors that might contribute to emission of chemicals from e-cigarettes. It also aims to compare the passive exposure to nicotine, particulates, carbon monoxide (CO), and VOCs from electronic and tobacco cigarettes.

MATERIALS AND METHODS

Study Protocols

We conducted two studies to assess emissions from e-cigarettes. The first study (Study 1) was designed to evaluate major factors that might affect exposure patterns. We generated vapor from three different models of e-cigarettes and released the vapor into an experimental exposure chamber. The aim of the second study (Study 2) was to compare emissions from e-cigarettes and cigarette smoke generated by experienced users of both products. Both studies are described in details below.

Study With Machine-Generated Vapors (Study 1)

Study 1 consisted of 12 experiments (Table . ; Experiments 1–12) conducted in an exposure chamber, each one lasting 2hr. During the first hour, background levels of all analyzed markers were taken. During the second hour, vapor from e-cigarettes was generated using a smoking machine and released into the exposure chamber. We measured 1-hr average concentrations of nicotine, aerosol particles ($PM_{2.5}$), CO, and selected VOCs. We also monitored changes in $PM_{2.5}$ and CO levels over 2hr.

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Table 1.
Changes in Nicotine, Aerosol Particles ($PM_{2.5}$), and Carbon Monoxide (CO) Air Concentration Inside Exposure Chamber After Use of E-Cigarette

Electronic Cigarettes

We studied three different models of e-cigarettes selected from the popular brands in Poland: (a) Colinss Age with Camel High atomized cartridge (cartomizer) (Colins Poland; EC1); (b) Dekang 510 Pen with SGC Regular cartridge (Ecigars Polska; EC2); and (c) Mild M201 Pen with Marlboro cartridge (Mild Poland; EC3). Although all cartridges were labeled as containing 18mg of nicotine, our previous study showed that they differed in nicotine levels: Colinss Camel contained 11mg, SGC Regular contained 18mg, and Mild Marlboro contained 19mg of the drug (Goniewicz, Kuma, et al., 2013). All products were purchased from online stores or shopping mall kiosks, and e-cigarettes batteries were charged for 24hr before the experiments.

Exposure Chamber

A 39-m^3 laboratory room (3.4×4.1×2.8 m) was equipped as an exposure chamber. The chamber had plain acrylic painted walls and tiled floor, with no windows, carpets, linings, or curtains inside. It was equipped with a regulated exhaust, ventilation system, and two fans for mixing the indoor air. Inside the chamber, there was a sampling station equipped with pumps and monitors, a smoking machine for generating e-cigarette vapors (see Generation of Vapors From E-Cigarettes section), and two chairs. The sampling station was located 1 m from a smoking machine and 10cm above the level of e-cigarettes.

The air exchange rates were determined before each experiment using a ventilation marker (methane) released into the exposure chamber according to the method described previously (Czogala & Goniewicz, 2005). The ventilation rate during the study varied from 1.37 (low) to 12.6 (high) air changes per hour (see also Supplementary Materials). Before each experiment, all surfaces inside the chamber were decontaminated by wiping with 10% aqueous solution of ethanol and intensive ventilation. Only one person, who operated the smoking machine and sampling station, was allowed inside the exposure chamber during Study 1.

Generation of Vapors From E-Cigarettes

In order to generate vapors from the e-cigarettes, a smoking machine was placed in the exposure chamber. We used an automatic single-channel piston-operated smoking machine Palaczbot (Technical University of Lodz) designed to generate vapor from e-cigarettes (Goniewicz, Knysak, et al., 2013; Goniewicz, Kuma, et al., 2013). In all experiments, the vapors from e-cigarettes were generated using the following puffing conditions: puff volume of 70ml, puff duration of 1.8 s, and intervals between puffs of 10 s. Two doses of vapor (see Generation of Vapors From E-Cigarettes section) were released into the exposure chamber with 30-min interval.

Vapors were generated from each of the three e-cigarettes under two variants of ventilation (intensive vs. restricted) and two variants of emission pattern (high vs. low) (3 brands × 2 variants of ventilation × 2 variants of emission). Ventilation of the exposure chamber was controlled during each experiment and adjusted by operating the exhaust. During the experiments with intensive ventilation, exhaust from the exposure chamber was fully opened, while it was partly closed during the experiments with restricted ventilation.

In order to modify exposure patterns, vapors from e-cigarettes were generated using 7 or 15 puffs, for low and high exposure, respectively. The rationale for using two levels of exposure (low vs. high) was to examine various doses of nicotine released with secondhand vapor. Although studies have shown that e-cigarette vapors contain significant amounts of nicotine, there are some controversy as to whether this nicotine is effectively absorbed in the lungs (Zhang, Sumner, & Chen, 2013). If there is little absorption, vapor exhaled by e-cigarette users might contain high levels of the drug. We assumed that if an e-cigarette user takes 15 puffs, and no nicotine is absorbed, then the entire amount of nicotine would be exhaled. If e-cigarettes effectively deliver nicotine to the bloodstream, exhaled vapors will contain only some of nicotine inhaled by the user. By releasing 7 puffs, we simulated the scenario in which approximately half of the nicotine from 15 puffs is absorbed and the balance is exhaled.

Analytical Procedures

Nicotine was measured using gas chromatography with nitrogen-phosphorus detector following active sampling on XAD-4 sorption tubes (SKC Inc.) according to the National Institute of Occupational Safety and Health reference method 2551 (National Institute of Occupational Safety and Health, 2003) with a detection limit of 0.22 μg/m^3. Aerosol particles ($PM_{2.5}$) were measured continuously with a SidePak AM510 Personal Aerosol Monitor. CO was also measured continuously with a Q-Trak Indoor Air Quality 8550 monitor (both instruments from TSI Inc.). The Sidepak was used with a calibration factor setting of 0.32, suitable for secondhand smoke (Wang et al., 2011; Klepeis, Ott, & Switzer, 2007). VOCs were analyzed using gas chromatography with mass spectrometry following active sampling on Anasorb CSC sorption tubes (SKC Inc.) according to the Occupational Safety and Hazards Agency reference method (Occupational Safety and Hazards Agency, 2000). The method allowed us to measure 11 compounds: benzene, toluene, chlorobenzene, ethylbenzene, m,p-xylene, o-xylene, styrene, naphthalene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene. Each monitor was calibrated according to manufacturer's recommendations, and all analytical procedures were validated and described in details in the Supplementary Materials.

Study With Human-Generated Vapors and Smoke (Study 2)

Subjects

We recruited five volunteers (all male; average age 37.6±16.0; body mass index 23.4±2.1; nicotine dependence by Fagerström Test for Nicotine

Dependence 5.8±2.9), who were dual users of e-cigarettes and conventional tobacco cigarettes. The subjects reported using e-cigarettes on average 14±7 times a day for at least 8 months (12.0±4.2) and additionally smoking on average 11±6 cigarettes per day for at least 5 years (18.2±14.1). Two subjects reported using M201 pen-style e-cigarette (18mg/ml; Mild brand), two others used eGo model (16mg/ml; Janty brand), and one used M401 model (18mg/ml; Nicore brand, Atina Poland). Three volunteers smoked L&M Blue Label brand of cigarettes (ISO yields/cigarette: nicotine 0.6mg; tar 8mg; CO 9mg), and two smoked Marlboro Gold brand (nicotine 0.5mg; tar 7mg; CO 7mg). All volunteers who participated in experiments were not given any money, gifts, or other economic incentives. Study 2 protocol was reviewed and approved by the Institutional Review Board at the Medical University of Silesia, Poland.

Emission of E-Cigarettes Vapors and Tobacco Smoke

Study 2 comprised five experiments (Table 1; Experiments 13–17), each lasting for 3hr. After background measures were taken for 1hr, a volunteer entered the room. Each volunteer used ad libitum their own e-cigarette twice for 5min with a 30-min interval. Then, the room was decontaminated as described above and ventilated for 5min. In the last hour, each subject smoked ad libitum entire tobacco cigarettes of their own brand. As with e-cigarettes, volunteers smoked two cigarettes lighting the second cigarette 30min after the first. One-hour average concentrations of nicotine, aerosol particles ($PM_{2.5}$), CO, and VOCs were determined as described above (baseline, e-cigarette, and tobacco cigarette). $PM_{2.5}$ and CO levels were also monitored continuously over 3hr of each experiment. Only two persons were allowed in the exposure chamber during Study 2: volunteer and operator of the sampling station.

Statistical Analysis

We compared average concentrations of each airborne marker using a nonparametric Mann–Whitney test. For both studies, we assessed the differences between baseline measures and each test condition (e-cigarette and tobacco cigarette). For Study 2, we also assessed differences in average indoor concentrations of each marker between electronic and tobacco cigarettes. For all tests, Statistica 10.0 software (StatSoft Inc.) was used. The significance level was established as $p < .05$.

RESULTS

Secondhand Exposure to Nicotine From E-Cigarettes

Study 1

Nicotine was detected in the air during all experiments where e-cigarette vapor was generated with the smoking machine and released into the exposure chamber. Mean 1-hr concentration of nicotine was 2.51±1.68 $\mu g/m^3$ and ranged from 0.82 to 6.23 $\mu g/m^3$. Comparison of average indoor air nicotine concentrations in the exposure chamber from three e-cigarette brands are presented in Figure 1. Changes between baseline values and an average nicotine concentration after emission of machine-generated vapors from e-cigarettes are presented in Table 1.

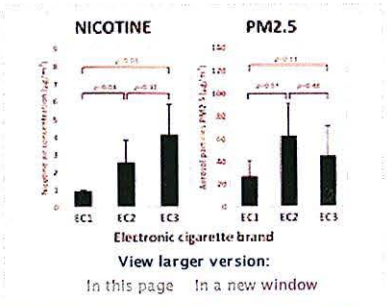

Figure 1.
Effect of e-cigarette brand on nicotine (left) and aerosol particle (right) concentration in the air inside exposure chamber.

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Study 2

Figure 2 shows baseline concentrations of nicotine and 1-hr medium concentrations after using e-cigarettes or after smoking tobacco cigarettes by volunteers. The average concentration of nicotine resulting from smoking tobacco cigarettes was 10 times higher than from e-cigarettes (31.60±6.91 vs. 3.32±2.49 μg/m^3, respectively; p = .0081).

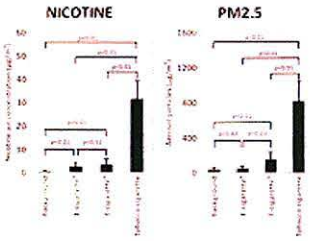

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Figure 2.
Comparison of indoor air nicotine (left) and aerosol particle (right) concentrations released from e-cigarette with background values and tobacco cigarette smoking.Note. [a]Vapor generated with smoking machine (Study 1); [b]Vapor exhaled by users (Study 2).

Secondhand Exposure to $PM_{2.5}$ From E-Cigarettes

Study 1

Aerosol particles were detected in the air during all experiments with vapor generated with the smoking machine and released into the exposure chamber. Mean concentration of $PM_{2.5}$ was 33.1±26.9 μg/m^3 and ranged from 6.6 to 85.0 μg/m^3. Comparison of average indoor air $PM_{2.5}$ levels in exposure chamber from three e-cigarette brands are presented on Figure 1. Changes between baseline values and mean $PM_{2.5}$ levels after emission of machine-generated vapors from e-cigarettes are presented in Table 1.

Study 2

Figure 2 shows baseline concentrations of $PM_{2.5}$ and 1-hr mean concentrations after using e-cigarettes or after smoking tobacco cigarettes by volunteers. The mean concentration of $PM_{2.5}$ resulting from smoking tobacco cigarettes was 7 times higher than from e-cigarettes (819.3±228.6 vs. 151.7±86.8 μg/m^3, respectively; p = .0081). Figure 3 shows changes in $PM_{2.5}$ concentration in the exposure chamber during one of the experiments in Study 2 (Experiment 15; see Table 1).

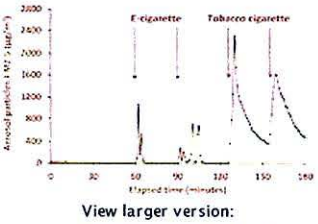

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Figure 3.
Changes of aerosol particle $PM_{2.5}$ concentrations during experiment of e-cigarette use and tobacco cigarette smoking in exposure chamber.

Secondhand Exposure to CO From E-Cigarette

Studies 1 and 2

There were no changes in CO concentration after using e-cigarettes in both studies (p > .05). However smoking of two tobacco cigarettes in

Study 2 increased CO concentration in the exposure chamber on average by 2 to 3 ppm (vol/vol) (Table 1; $p < .05$).

Secondhand Exposure to VOCs From E-Cigarettes

Study 1

During the study with machine-generated e-cigarette vapor, only toluene was detected in the exposure chamber. No statistical difference was found between average toluene concentration after release of e-cigarette vapor and baseline values (6.63±0.21 vs. 4.15±2.69 μg/m^3, respectively; $p = .1582$).

Study 2

As with Study 1, toluene was the only VOC detected in the exposure chamber, and the use of e-cigarette did not change the concentration of toluene (3.79±2.16 vs. 4.09±2.12 μg/m^3, respectively; $p = .8513$). Smoking two tobacco cigarettes increased the concentration of four compounds: toluene, ethylbenzene, m,p-xylene, and o-xylene ($p < .05$). For toluene, the average concentration after smoking tobacco cigarettes was 3.5-fold higher than after using e-cigarettes (14.75±6.02 vs. 4.15±2.69 μg/m^3, respectively; $p < .05$). The average concentrations of ethylbenzene, m,p-xylene, and o-xylene after smoking tobacco cigarettes were 1.17±1.44, 1.94±1.14, and 0.48±0.95 μg/m^3, respectively; $p < .05$).

DISCUSSION

Principal Findings

The key finding of this study is that e-cigarettes emit significant amounts of nicotine but do not emit significant amounts of CO and VOCs. We also found that the level of secondhand exposure to nicotine depends on the e-cigarette brand. However, the emissions of nicotine from e-cigarettes were significantly lower than those of tobacco cigarettes.

Strengths and Limitations of the Study

To our knowledge, this is one of the first studies to measure the concentrations of nicotine, $PM_{2.5}$, CO, and VOCs emitted by e-cigarettes and to compare the emissions of electronic and conventional tobacco cigarettes in a conventionally ventilated, full-sized room. By comparing e-cigarette vapors generated with a smoking machine to those generated by experienced e-cigarette users in a controlled setting allowed us to control for potential factors that may affect exposure patterns.

Results from experiments with human subjects who used both electronic and tobacco cigarettes allowed us to compare the emissions and the potential exposures by the two products. One of the most important aspects of our study is that the e-cigarette vapors and tobacco smoke were generated by long-term dual users of the products, and we did not modified the way volunteers were typically using the products.

Our findings are supported by results from study by McAuley et al. (2012) who examined the chemical composition of freshly generated vapor collected in a small emission chamber and found that the total air emission concentrations for many pollutants from e-cigarettes were very low. Our study examined the potential effect of various e-cigarette brands on patterns of exposure, whereas McAuley, et al. (2012) studied vapors generated from the same model of e-cigarette with varying nicotine solutions and found that the chemical composition of the vapors from different solutions differed in levels of nicotine and other chemicals. Our study showed that the level of exposure also differs between e-cigarette brands. These findings are also consisted with our previously reported data showing high variability in composition of freshly generated vapors among the products (Cobb, Kuma, et al., 2013). These findings

should be taken into careful consideration when exposure to e-cigarette vapors is considered.

The study has several limitations. An important limitation of our study is that we measured a limited number of chemicals that might be contained within e-cigarette vapors. We reported previously that e-cigarette vapors contain significant levels of carbonyls, including toxic and carcinogenic formaldehyde, acetaldehyde, and acrolein (Goniewicz, Knysak, et al., 2013). These compounds were not measured in this study. Studies by Schripp, Markewitz, Uhde, and Salthammer (2013) and McAuley et al. (2012) found that there is a risk of exposure to carbonyls from e-cigarettes, although the levels of the compounds were lower than those in SHS. We did not investigate other significant factors affecting exposure to e-cigarette vapors, for example, room volume and number of e-cigarettes used simultaneously in a single room. The exposure chamber input air was not filtered during the experiments, and ventilation air exchange rates of exposure chamber were higher than residential rates (Yamamoto, Shendell, Winga, et al., 2011). Finally, the study assessed concentrations of several markers in the air but not serum concentrations in people exposed to secondhand vapors. These airborne concentrations do not necessarily reflect the serum concentration and the impact on health of people exposed to these vapors.

Unanswered Questions and Future Research

This study did not test potential health effects associated with secondhand exposure to vapors from e-cigarettes. To date, there are few studies that have tested the acute effects of brief exposure to secondhand e-cigarette vapors. One study by Flouris et al. (2012) found that acute passive "vaping" of e-cigarettes did not influence complete blood count in human subjects. Another study by the same authors found that controlled 1-hr exposure to e-cigarette vapors did not significantly affect lung function in human subjects (Flouris et al., 2013). We found no publications on the cardiovascular effects of passive exposure to e-cigarette vapors or on the health effects of secondhand exposure to e-cigarette vapors among vulnerable population, including children, pregnant women, and people with cardiovascular conditions.

There is some discrepancy between our findings and results reported recently by Flouris et al. (2012) on secondhand exposure to nicotine. Our data suggest that secondhand exposure to nicotine from e-cigarettes is on average 10 times less than from tobacco smoke. However, Flouris et al. (2013) found that e-cigarettes and tobacco cigarette generated similar effects on serum cotinine levels after 1-hr passive exposure (2.4±0.9 vs. 2.6±0.6ng/ml, respectively; $p < .001$). Future research should look for correlation between indoor air levels of nicotine from e-cigarettes and its uptake by passive smokers to explain this discrepancy.

Future research should also study exposure patterns over extended periods of time and the potential health effects of long-term exposure to secondhand e-cigarette vapors. Data are also needed from the field studies conducted in homes and public places where e-cigarettes are in use. Moreover, this study only focused on nicotine and a limited number of chemicals released from e-cigarettes. Further research is needed to explore emission and exposure to other toxicants and carcinogens identified in e-cigarettes, for example, carbonyl compounds (Goniewicz, Knysak, et al., 2013).

It remains unclear whether concentration of $PM_{2.5}$ will be a suitable and reliable airborne marker to evaluate emission and exposure to secondhand vapors from e-cigarettes. Although some studies suggest that e-cigarette vapor and SHS have comparable aerosol particle size distribution and deposition patterns, we found that concentration of e-cigarette aerosol particles tends to decrease rapidly when diluted in the

air. Figure 3 shows that there is a significant particle mass signal from e-cigarette vapor but that it dissipates much more rapidly than cigarette smoke. This may be due to the evaporation of the aerosol in addition to deposition on the surfaces and removal by ventilation. There is a need for developing an accurate methodology to assess e-cigarette vapor indoor concentrations. Finally, the vapor from e-cigarettes might be easily deposited on surfaces to form "thirdhand" e-cigarette vapor, and studies are needed to assess the deposition rate, potential formation of toxic derivatives, and human exposure.

Implications for Policy Makers

The study showed that e-cigarettes might involuntarily expose nonsmokers and people who do not use e-cigarettes to nicotine. In the past, secondhand exposure to nicotine has been primarily associated with exposure to ETS. E-cigarettes have created the new scenario under which bystanders might be exposed to low levels of nicotine but not to the other toxins found in tobacco smoke. It remains unclear whether exposure to low levels of nicotine indoors causes any harm to bystanders, including children, pregnant women, and person with cardiovascular conditions.

Besides nicotine, e-cigarette vapor contains significant amounts of propylene glycol and vegetable glycerin. Although both compounds are considered to be safe, there is lack of data on health risk associated with prolonged exposure to their vapors. Propylene glycol has been shown to cause upper airway irritation (Vardavas et al., 2011). Some volatile carbonyl compounds have been also identified in the vapor of e-cigarettes (Goniewicz, Kuma-Kozlik, et al., 2013). More research is needed about the health risk associated with exposure to toxic constituents of the vapors. The physicochemical changes may also occur after vapors are released into ambient air. It has been shown that such changes increase toxicity of tobacco smoke two- to four-fold (Pöschl & Glantz, 2006). These data are needed to inform regulators whether e-cigarettes should be included under smoke-free policies to protect nonusers from inhaling the toxicants.

E-cigarettes are promoted to circumvent smoke-free policies (Grana & Ling, 2013). Exempting e-cigarettes from smoke-free regulations, besides creating secondhand exposure to nicotine, might have additional implications for public health. It remains unclear whether observation of smokers using e-cigarettes, especially by young people, might reverse the denormalization of smoking behavior as a social norm. Cigarette smokers might use e-cigarettes as additional sources of nicotine in places with smoking bans. Data are needed to determine whether dual use of the products (e-cigarettes in addition to tobacco cigarettes) results in reinforcement of nicotine addiction.

SUPPLEMENTARY MATERIAL

Supplementary Material can be found online at http://ntr.oxfordjournals.org/

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DECLARATION OF INTERESTS

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Online ISSN 1469-994X • Print ISSN 1462-2203 **Analysis of harm and risk associated with electronic cigarettes as tobacco cigarette substitutes: a systematic review**
Therapeutic Advances in Drug Safety (2014) 5 (2): 67-86

HB 40

SAMPLES OF FORM LETTERS IN OPPOSITION

SEE ARCHIVED FILES FOR ORIGINALS

Form emails in opposition to HB 40

Included emails from:

Andrew Pratt – Anchorage

Roxana Concepcion – North Pole

Sandra Cornelius – Fairbanks

Steven Mapes – Kenai

Jason Gasses – Fairbanks

Tyler Wood – North Pole

David Sauter – Fair banks

Benjamin Nguyen – Eagle River

Barbara Jones – JBER

Jamie Chilton – Kenai

James Manakis – Anchorage

Shauna Tieszen – Anchorage

Jason Stenson – Anchorage

SAMPLE OF FORM EMAILS

Dear Paul Seaton,

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,
Andrew Pratt

HB 40

THE FOLLOWING FORM LETTER IN OPPOSITION WAS SUBMITTED BY 526 PEOPLE

SEE ARCHIVED FILES FOR ORIGINALS

To Whom it May Concern,
I do not support House Bill 40. The use of electronic cigarettes is not smoking, and should never be classified as such. By definition alone, smoke is created during combustion, and there is no combustion in said devices. A definition change as such has a detrimental effect on technology that has the potential to save millions of lives. New research is daily released stating that electronic cigarettes are safer than traditional cigarettes, including the effects on bystanders.

Eric Richardson
Name

Fairbanks Alaska
City, State