

## Electronic cigarettes

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This briefing has been written because many stop smoking services are struggling to decide what role they have in relation to electronic cigarettes, and how they should respond to enquiries about them from smokers. There is also debate about the future licencing of electronic cigarettes and whether they offer an opportunity to make significant public health improvements or not.

### Executive summary

- Electronic cigarettes are devices that deliver nicotine by heating and vapourising a solution that typically contains nicotine, propylene glycol and/or glycerol, and flavourings
- Electronic cigarette use is increasing in smokers wanting to quit but particularly among smokers who want to reduce the health risks of smoking or to save money
- Electronic cigarettes are not currently licensed for smoking cessation; they do have to comply with consumer protection legislation
- The quality of electronic cigarettes is improving. With experience, users can achieve overall blood nicotine levels similar to those achieved with smoking conventional cigarettes; although it takes longer to reach these levels and they still receive less nicotine per puffing session
- Electronic cigarettes can reduce urges to smoke and can help smokers quit, although these data are not as robust as those for licensed stop smoking medicines
- Data from one good quality randomised controlled trial show that electronic cigarettes were as effective as nicotine patches in helping people stop smoking for six months, when used in combination with minimal support from a trained practitioner
- Short-term exposure to electronic cigarettes appears to be associated with few serious risks. Mouth and throat irritation are the most commonly reported symptoms and these appear to subside over time. There are no high quality safety data regarding long-term electronic cigarette use but there is no a-priori reason to expect that such use may pose risks anywhere near the risks associated with smoking
- Low levels of toxicants and carcinogens have been detected in electronic cigarette liquid and vapour although these are much lower than those found in conventional cigarette smoke and are not considered to pose any passive inhalation risk



## Vaping Facts

### What is Vaping?

Electronic cigarettes, also called personal vaporizers that deliver an e-liquid solution made up of propylene glycol, vegetable glycerin, flavoring and nicotine. The vaporization process is carried out by a battery-powered heating element called the "atomizer". The individual inhales vapor, not smoke. Electronic cigarettes come in a variety of styles, models and sizes.

### What is in the solution?

The primary mix for the solution is Propylene Glycol, Vegetable Glycerin, various food grade flavoring and some have nicotine. While there are no requirements for labeling all of Minnesota's major manufacturers of vaping solution include ingredients AND nicotine content on their labels. All of these ingredients have substantial testing history and in the US. Propylene glycol is considered "generally recognized as safe" by the U.S. Food and Drug Administration.

### What is IVRM?

IVRM is an association of manufacturers & retailers across Minnesota. We are small business owners working in a new and growing industry serving our customers with quality products in their search for alternatives to products sold by big tobacco companies. We are not affiliated with "Big Tobacco" and do not support many of their tactics and products.

### Who are our Customers?

**We market to smokers NOT to kids.** We supported legislative efforts to clarify that ALL vaping products are prohibited for sale to minors. The vast majority of our customers have been using tobacco products for years or decades and have failed to quit through more traditional treatments.

### What Will IVRM Support?

We support regulating the vaping industry to limit youth access and keep potentially harmful chemicals in the hands of our trained staffs. We support policies based on facts and scientific evidence rather than those based on speculation and fear. We want to support our customer's efforts in choosing products NOT made by Big Tobacco, including e-cigarettes. We also support the right of individual businesses to make decisions based on customer input and opinions.

**Myth: Vaping solution contains Anti-Freeze or Diethylene Glycol**

**Fact:** In 2009, the FDA released a press statement claiming that they tested electronic cigarettes and found diethylene glycol, an ingredient in anti-freeze BUT Independent labs extensively tested other electronic cigarettes and found no evidence of diethylene glycol, the toxic component of anti-freeze claimed to have been found in the brands the FDA tested. Additionally the FDA has said that the testing of those samples were flawed.

**Myth: We have no idea what is in E liquid or nicotine levels.**

**Fact:** All of Minnesota e-liquid manufacturers list ingredients AND nicotine levels on *all* of their bottles. MN legislative leaders had no interest in label requirements.

**Myth: e-cigarettes contain toxic levels of metals.**

**Fact:** There is no question that the presence of trace levels of metals in electronic cigarette vapor needs to be addressed. Quality control measures need to be in place to minimize the presence of metals in electronic cigarette aerosol. However, there is no reason to sound the alarm from the data reported in the present study because it fails to compare the detected levels with regulatory standards for pharmaceutical products, including FDA-approved nicotine inhalers.

**Myth: Vaping will “Renormalize” smoking and create incentive for youth to smoke.**

**Fact:** There has been no study or evidence that supports the “renormalization” theory. Recently the British Government published a report stating “there is no current evidence that the presence of electronic cigarettes might normalize smoking.

**Myth: We are targeting youth with our products.**

**Fact:** According to Clearway MN “Research shows keeping tobacco prices high is a top way to motivate quitting and to prevent youth from starting. In Minnesota, price increases have been the top driver of smoking declines since 1993. The average cost of a bottle of solution sold at our shops is around \$20 per bottle. This does NOT include a device needed to use the liquid which would cost another \$60 for a starter kit. Our entry level price of \$80.00 is a significant barrier for any kids wanting to “just try” one.

## Electronic cigarettes

- Concurrent (dual) use of conventional cigarettes and electronic cigarettes has been associated with greater motivation to quit, and to a reduction of smoke intake from regular cigarettes. This may be associated with health benefits, although the extent of any such benefits remains to be determined
- There are currently no robust data to support the concern that the existence of electronic cigarettes might 'normalise' smoking and increase use of conventional cigarettes

### Recommendations for practice

1. Be open to electronic cigarette use in people keen to try them; especially in those that have tried, but not succeeded, in stopping smoking with the use of licensed stop smoking medicines
2. Provide advice on electronic cigarettes that includes:
  - Electronic cigarettes can provide some of the nicotine that would have otherwise been obtained from smoking regular cigarettes
  - Electronic cigarettes are not a magic cure, but some people find them helpful for quitting, cutting down their nicotine intake and managing temporary abstinence
  - There is a wide range of electronic cigarettes available and clients may need to try various brands, flavours and nicotine dosages before they find a brand that they like
  - Electronic cigarette use is not exactly like smoking and users may need to experiment and learn to use them effectively (e.g. longer 'drags' are required and a number of short puffs may be needed initially to activate the 'vapouriser' and improve nicotine delivery)
  - Although some health risks from electronic cigarette use may yet emerge, these are likely to be, at worst, only a small fraction of the risks of smoking. This is because electronic cigarettes do not contain combustion chemicals which cause lung and heart disease and cancer
3. Multi-session behavioural support, as provided by trained stop smoking practitioners, is likely to improve the efficacy of electronic cigarettes in the same way such support markedly increases the efficacy of NRT
4. Stop smoking services can provide behavioural support to clients who are using electronic cigarettes and can include these clients in their national data returns.\* As with other unlicensed nicotine containing products, the stop smoking service cannot provide or prescribe them until such time as there are licensed options available
5. If a client being seen at a stop smoking service is using an electronic cigarette but also wants to use NRT, then it is OK for them to use the two in conjunction. They do not need to have stopped using the electronic cigarette before they can use NRT

\* providing they adhere to the national data definitions in the service and monitoring guidance, which are based upon the Russell Standard: <http://www.ncsct.co.uk/usr/pub/assessing-smoking-cessation-performance-in-nhs-stop-smoking-services-the-russell-standard-clinical.pdf>

## Statement from specialists in nicotine science and public health policy

Dr Margaret Chan  
Director General  
World Health Organisation  
Geneva

CC: FCTC Secretariat, Parties to the FCTC, WHO Regional Offices

26 May 2014

Dear Dr Chan

### **Reducing the toll of death and disease from tobacco – tobacco harm reduction and the Framework Convention on Tobacco Control (FCTC)**

We are writing in advance of important negotiations on tobacco policy later in the year at the FCTC Sixth Conference of the Parties. The work of WHO and the FCTC remains vital in reducing the intolerable toll of cancer, cardiovascular disease and respiratory illnesses caused by tobacco use. As WHO has stated, up to one billion preventable tobacco-related premature deaths are possible in the 21st Century. Such a toll of death, disease and misery demands that we are relentless in our search for all possible practical, ethical and lawful ways to reduce this burden.

It is with concern therefore that a critical strategy appears to have been overlooked or even purposefully marginalised in preparations for FCTC COP-6. We refer to 'tobacco harm reduction' - the idea that the 1.3 billion people who currently smoke could do much less harm to their health if they consumed nicotine in low-risk, non-combustible form.

We have known for years that people 'smoke for the nicotine, but die from the smoke': the vast majority of the death and disease attributable to tobacco arises from inhalation of tar particles and toxic gases drawn into the lungs. There are now rapid developments in nicotine-based products that can effectively substitute for cigarettes but with very low risks. These include for example, e-cigarettes and other vapour products, low-nitrosamine smokeless tobacco such as snus, and other low-risk non-combustible nicotine or tobacco products that may become viable alternatives to smoking in the future. Taken together, these tobacco harm reduction products could play a significant role in meeting the 2025 UN non-communicable disease (NCD) objectives by driving down smoking prevalence and cigarette consumption. Indeed, it is hard to imagine major reductions in tobacco-related NCDs without the contribution of tobacco harm reduction. Even though most of us would prefer people to quit smoking and using nicotine altogether, experience suggests that many smokers cannot or choose not to give up nicotine and will continue to smoke if there is no safer alternative available that is acceptable to them.

We respectfully suggest that the following principles should underpin the public health approach to tobacco harm reduction, with global leadership from WHO:

## Statement from specialists in nicotine science and public health policy

1. *Tobacco harm reduction is part of the solution, not part of the problem.* It could make a significant contribution to reducing the global burden of non-communicable diseases caused by smoking, and do so much faster than conventional strategies. If regulators treat low-risk nicotine products as traditional tobacco products and seek to reduce their use without recognising their potential as low-risk alternatives to smoking, they are improperly defining them as part of the problem.
2. *Tobacco harm reduction policies should be evidence-based and proportionate to risk, and give due weight to the significant reductions in risk that are achieved when a smoker switches to a low risk nicotine product.* Regulation should be proportionate and balanced to exploit the considerable health opportunities, while managing residual risks. The architecture of the FCTC is not currently well suited to this purpose.
3. *On a precautionary basis, regulators should avoid support for measures that could have the perverse effect of prolonging cigarette consumption.* Policies that are excessively restrictive or burdensome on lower risk products can have the unintended consequence of protecting cigarettes from competition from less hazardous alternatives, and cause harm as a result. Every policy related to low risk, non-combustible nicotine products should be assessed for this risk.
4. *Targets and indicators for reduction of tobacco consumption should be aligned with the ultimate goal of reducing disease and premature death, not nicotine use per se, and therefore focus primarily on reducing smoking.* In designing targets for the non-communicable disease (NCD) framework or emerging Sustainable Development Goals it would be counterproductive and potentially harmful to include reduction of low-risk nicotine products, such as e-cigarettes, *within these targets*: instead these products should have an important role in *meeting the targets*.
5. *Tobacco harm reduction is strongly consistent with good public health policy and practice and it would be unethical and harmful to inhibit the option to switch to tobacco harm reduction products.* As the WHO's Ottawa Charter states: "*Health promotion is the process of enabling people to increase control over, and to improve, their health*". Tobacco harm reduction allows people to control the risk associated with taking nicotine and to reduce it down to very low or negligible levels.
6. *It is counterproductive to ban the advertising of e-cigarettes and other low risk alternatives to smoking.* The case for banning tobacco advertising rests on the great harm that smoking causes, but no such argument applies to e-cigarettes, for example, which are far more likely to reduce harm by reducing smoking. Controls on advertising to non-smokers, and particularly to young people are certainly justified, but a total ban would have many negative effects, including protection of the cigarette market and implicit support for tobacco companies. It is possible to target advertising at existing smokers where the benefits are potentially huge and the risks minimal. It is inappropriate to apply Article 13 of the FCTC (Tobacco advertising, promotion and sponsorship) to these products.

## Statement from specialists in nicotine science and public health policy

7. *It is inappropriate to apply legislation designed to protect bystanders or workers from tobacco smoke to vapour products.* There is no evidence at present of material risk to health from vapour emitted from e-cigarettes. Decisions on whether it is permitted or banned in a particular space should rest with the owners or operators of public spaces, who can take a wide range of factors into account. Article 8 of the FCTC (Protection from exposure to tobacco smoke) should not be applied to these products at this time.
8. *The tax regime for nicotine products should reflect risk and be organised to create incentives for users to switch from smoking to low risk harm reduction products.* Excessive taxation of low risk products relative to combustible tobacco deters smokers from switching and will cause more smoking and harm than there otherwise would be.
9. *WHO and national governments should take a dispassionate view of scientific arguments, and not accept or promote flawed media or activist misinterpretations of data.* For example, much has been made of 'gateway effects', in which use of low-risk products would, it is claimed, lead to use of high-risk smoked products. We are unaware of any credible evidence that supports this conjecture. Indeed, similar arguments have been made about the use of smokeless tobacco in Scandinavia but the evidence is now clear that this product has made a significant contribution to reducing both smoking rates and tobacco-related disease, particularly among males.
10. *WHO and parties to the FCTC need credible objective scientific and policy assessments with an international perspective.* The WHO Study Group on Tobacco Product Regulation (TobReg) produced a series of high quality expert reports between 2005 and 2010. This committee should be constituted with world-class experts and tasked to provide further high-grade independent advice to the WHO and Parties on the issues raised above.

The potential for tobacco harm reduction products to reduce the burden of smoking related disease is very large, and these products could be among the most significant health innovations of the 21<sup>st</sup> Century – perhaps saving hundreds of millions of lives. The urge to control and suppress them as tobacco products should be resisted and instead regulation that is fit for purpose and designed to realise the potential should be championed by WHO. We are deeply concerned that the classification of these products as tobacco and their inclusion in the FCTC will do more harm than good, and obstruct efforts to meet the targets to reduce non-communicable disease we are all committed to. We hope that under your leadership, the WHO and FCTC will be in the vanguard of science-based, effective and ethical tobacco policy, embracing tobacco harm reduction.

We would be grateful for your considered reaction to these proposals, and we would like to request a meeting with you and relevant staff and a small delegation of signatories to this letter. This statement and any related information will be available on the Nicotine Science and Policy web site (<http://nicotinepolicy.net>) from 29 May 2014.

Yours sincerely,

## Statement from specialists in nicotine science and public health policy

Signatories this statement at 26 May 2014

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## Statement from specialists in nicotine science and public health policy

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Since being introduced to the US in 2009 E-cigarettes and vaping products have been growing and gaining more users and supporters. Millions of people worldwide have turned to these devices in an effort to improve their health and find a better alternative to traditional tobacco products. The Independent Vaping retailers of Minnesota (IVRM) are committed to providing high quality products that meet the needs of our customers and communities in an effort to reduce the number of people smoking in Minnesota.

It is because of this goal that we are dismayed when organizations also trying to reduce smokers support policies and efforts that create barriers for our member businesses but also for the thousands of customers, many of whom have exhausted other cessation options and programs. We will continue to work with policy makers throughout the state to provide information about the products we sell and the customers we serve.

### **A. Support for Vapor Products Among the Public Health Community Continues to Grow**

There are over 150 published studies about e-cigarette toxicity, chemical composition, effects on the human body, and cessation. Every month, as the scientific literature grows supporting e-cigarettes as being far less hazardous than smoking, the support for harm reduction policies among public health advocates, and even some in the tobacco control community, grows as well. Indeed, earlier this year more than 50 scientific experts signed a letter to the World Health Organization calling vapor products “among the most significant health innovations of the 21st century — perhaps saving hundreds of millions of lives.”<sup>1</sup>

Additionally, in January the staunchly anti-tobacco Dr. David Abrams of the Legacy Institute, which used to run the very graphic anti-smoking Truth Campaign commercials, penned an editorial in the *Journal of the American Medical Association* entitled, “Promise and Peril of e-Cigarettes: Can Disruptive Technology Make Cigarettes Obsolete?”<sup>2</sup> Dr. Abrams and many others believe the answer to that question is a resounding YES.

These public health advocates supporting e-cigarettes are almost universally extremely strong proponents of smoking bans. But because e-cigarettes do not create smoke and have not been shown to emit levels of chemicals that are harmful to bystanders, these advocates do not support banning usage where smoking is banned. Indeed, Dr. Abrams, speaking at a conference in New York at the end of last year, argued that electronic cigarettes should not be subject to sin taxes or usage bans as a way of nudging smokers towards voluntarily making a healthier choice.<sup>3</sup>

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<sup>1</sup> Hirschler, B. “Top scientists warn WHO not to stub out e-cigarettes,” Reuters, May 2014, <http://uk.reuters.com/article/2014/05/28/health-ecigarettes-idUKL6N0OD3ZE20140528>

<sup>2</sup> Abrams, D. “Promise and Peril of e-Cigarettes: Can Disruptive Technology Make Cigarettes Obsolete,” *Journal of the American Medical Association*, January 2014

<sup>3</sup> Herzog, B. “A Vaping State of Mind – Regulatory and Public Health Panels – Transcript,” Wells Fargo Securities, November 2013, document available by request.

Additionally governmental and anti smoking organizations in Europe are starting to weigh in on the correct way to regulate these products. With these products having more exposure and use over time than in America it is worth noting that many are supporting these products and their potential to reduce smoking. *Action on Smoking and Health UK* has stated "it does not consider it appropriate to include e-cigarettes under smoke free regulations". The National Centre for Smoking Cessation recently recommended support for those using electronic cigarette "especially in those that have tried, but not succeeded, in stopping smoking with the use of licensed stop smoking medicines"

### **B. Smoking Continues to Drop Among Youth and Nonsmokers Aren't Becoming Regular Users of Vapor Products**

Some have implied that e-cigarettes were proving to be gateways to traditional cigarettes or, worse, heroin and cocaine. The evidence does not support this claim. In fact, just recently, the CDC released the results of its 2013 CDC National Youth Tobacco Survey.<sup>4</sup> Critical findings from that survey were:

- Teen "ever smokers" were 23 times more likely than "never smokers" to report past 30 day use of an e-cigarette (6.9% vs. 0.3%)
- Teen "ever smokers" were 22.4 times more likely than "never smokers" to report "ever use" of an e-cigarette (20.2% vs. 0.9%).
- **Just .3% of teen "never smokers" reported "past 30 day use" of an e-cigarette, and under 1% of "never smokers" reported "ever use" of an e-cigarette.**

In other words, only a tiny number of non-smoking teens are experimenting with e-cigarettes (i.e., taking at least one puff in their entire life), and among those you do, only approximately *1 in 300* have taken a puff in the past 30 days.

Even in the recent survey released by the MN department of health in which there was an increase in the number of teens who have tried an e-cigarette states that "it would be premature to equate the use of e-cigarettes with the use of conventional cigarettes and other tobacco products."

Also critical to this discussion is the fact that as teen e-cigarette use has increased, smoking rates among teens have continued to decline. In June 2014, the CDC reported its results from the National Youth Risk Behavior Survey (YRBS), which was given to over 13,000 teens in 2013. Despite false claims that e-cigarette use is somehow becoming a

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<sup>4</sup> Bunnell, R.E., et. al., "Intentions to smoke cigarettes among never-smoking U.S. middle and high school electronic cigarette users, National Youth Tobacco Survey, 2011-2013," *Nicotine & Tobacco Research*, September 2014.

gateway to cigarette use, the CDC reported a historic low in teen smoking; 15.7%.<sup>5</sup>

It is also important that e-cigarette usage numbers be put in the proper context of other risky behavior taken by teens. In February 2014, CNN's Jen Christensen reported that while approximately 3% of teens had taken at least one puff off an e-cigarette in the prior 30 days, during the same 30 day period 39% of students said they drank some amount of alcohol, 22% binge drank, and amazingly, 24% had driven in a car with someone who had been drinking alcohol.<sup>6</sup>

### **C. Flavors Play an Important Role in Helping Smokers Quit**

Many opposed to e-cigarettes have accused e-cigarette companies of marketing to youth because their products come in flavors other than tobacco and menthol. Curiously, they have ignored important large-scale surveys of adult vapers (e-cigarette users) that not only found that most adult vapers use flavors, but that adult vapers who use flavors are more likely to be smoke-free than those using tobacco flavors.

Last year, the International Journal of Environmental Research and Public Health published a survey of 4,618 adult vapers that was conducted by the Onassis Cardiac Surgery Center's Dr. Konstantinos Farsalinos.<sup>7</sup> The key findings of the study were as follows:

- 91% of the 4,618 participants were former smokers, while the rest used both cigarettes and vapor products ("dual users").
  - o But dual users reported that their average cigarette consumption had dropped from 20 cigarettes to 4 per day.
- At initiation, vapor product users tended to use tobacco flavors, but most vapers soon switched to fruit and sweet flavors.
- Participants rated flavor variability as "very important" (score 4 out of 5) in their effort to reduce or completely stop their cigarette consumption.
- The more flavors a vapor reported using regularly, the more likely they were to be smoke-free.
- **Fruit and sweet flavors were, respectively, used regularly by 69% and 61% of adult vapers.**

Moreover, even the Food and Drug Administration recognizes that palatable flavors are helpful to adult smokers looking to reduce harm. After all, if adults only liked tobacco flavors, why would the agency have approved other in flavors such as White Ice Mint, Cinnamon Surge, Fruit Chill, and Fresh Mint?

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<sup>5</sup> "Cigarette smoking among U.S. high school students at lowest level in 22 years." CDC, June 2014. <http://www.cdc.gov/media/releases/2014/p0612-YRBS.html>

<sup>6</sup> Christensen, J. "E-cigarettes: Healthy tool or gateway device," CNN, February 2014. <http://www.cnn.com/2013/09/12/health/e-cigarettes-debate/index.html>

<sup>7</sup> Farsalinos, K, et. al. "Impact of Flavour Variability on Electronic Cigarette Use Experience: An Internet Survey." *International Journal of Environmental Research and Public Health*, 2013.

## D. Vapor Products Help Smokers Quit

In August of 2014 the journal *Addiction* published a study that tracked over 6,000 smokers who reported trying to quit in the prior year. The largest share of respondents who were able to quit – 20 percent – had done so using e-cigarettes, beating those who quit without help (15 percent) and those who used nicotine-replacement therapy such as gum or a patch (10 percent).<sup>8</sup> This was not an obscure study either, as outlets such as the New York Times dedicated significantly-sized articles to discussing the study's implications.

Additionally, a 2014 survey undertaken by Action on Smoking and Health – the UK's largest anti-smoking charity – found that among the UK's 2.1 million adults who had used e-cigarettes in the prior 30 days, approximately 700,000 reported being ex-smokers.<sup>9</sup> Not surprisingly, the main reason given by ex-smokers for using e-cigarettes was that it helped them quit smoking, while current smokers primarily reported that they were using e-cigarettes to reduce the amount they smoke. The researchers further noted that "regular use of electronic cigarettes amongst children and young people is rare and is confined almost entirely to those who currently or have previously smoked."

Lastly, just days before this hearing, the journal *Nicotine & Tobacco Research* published a longitudinal study of electronic cigarette use in a population-based sample of adult smokers.<sup>10</sup> The smokers were first contacted in 2011 and 2012 and then contacted for a follow-up survey in 2014. The study found that compared to smokers who had not tried e-cigarettes, **daily users of vapor products were SIX TIMES more likely to be nonsmokers.**

Clearly, e-cigarettes are helping smokers move away from combustible cigarettes. We submit that this is a huge benefit for public health.

## E. E-Cigarette Vapor Poses No Risk to Bystanders

A favorite tactic of e-cigarette detractors is to make reference to scary-sounding chemicals that have been detected in e-cigarette liquid or vapor. Critically, they fail to note the actual levels of these chemicals found. In doing so, they ignore a central tenet of toxicology – the dose makes the poison.

For example, opponents are fond of saying that e-cigarette vapor contains metals,

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<sup>8</sup> Brown J., et. al. "Real-world effectiveness of e-cigarettes when used to aid smoking cessation: A cross-sectional population study." *Addiction* 109, August 2014.

<sup>9</sup> "Use of electronic cigarettes in Great Britain." Action on Smoking and Health. July 2014. [http://www.ash.org.uk/files/documents/ASH\\_891.pdf](http://www.ash.org.uk/files/documents/ASH_891.pdf)

<sup>10</sup> Biener L, et. al. "A Longitudinal Study of Electronic Cigarette Use in a Population-based Sample of Adult Smokers: Association with Smoking Cessation and Motivation to Quit." *Nicotine & Tobacco Research*, October 2014.

implying that e-cigarette vapor is a source of inhaled toxic metals. Without proper context, presentation of this information is misleading. Dr. Michael Siegel, a long-time anti-tobacco researcher who testified against cigarette companies in lawsuits that cost them billions, has noted that the levels of metals delivered to vapor product users are far lower than the daily exposures permitted by the authoritative United States Pharmacopeial Convention for inhalable medications.<sup>11</sup> Indeed, Dr. Siegel compared the levels of metals expected to be inhaled by the average e-cigarette user vs. the average user of the FDA-approved Nicorette nicotine inhaler and found that the levels were nearly identical. For some metals, electronic cigarette vapor contained LESS metals than the Nicorette inhaler. But again, these trace levels are allowed in medications, and metals in neither e-cigarette vapor nor the mist released by a nicotine inhaler is a threat to the user or bystander.

I'd also like to bring your attention to two critical indoor air studies. First, the medical journal BMC Public Health recently published a study by Drexel University Professor and toxicologist Dr. Igor Burstyn entitled "Peering Through the Mist."<sup>12</sup> Dr. Burstyn utilized over 9,000 observations of electronic cigarette liquids and vapor in order to assess possible threats to the direct user and bystanders. Dr. Burstyn concluded that the levels of chemicals in e-cigarette vapor are so low so as to pose no apparent risk to bystanders.

Second, the journal Tobacco Control published an excellent study a year ago that was funded in part by the National Institutes of Health. That study tested 12 different e-cigarettes vs. a traditional combustible cigarette vs. the FDA-approved Nicorette inhaler. That study reported the levels of toxicants and chemicals identified as causing harm in cigarette smoke were present at trace amounts 9-450x less than in cigarette smoke.<sup>13</sup> Even more importantly, the researchers noted that the levels were similar to those that are released by the Nicorette inhaler.

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<sup>11</sup> Siegel, M. "Metals in Electronic Cigarette Vapor are Below USP Standards for Metals in Inhalation Medications," Rest of the Story – Tobacco Analysis and Commentary, April 2013, <http://tobaccoanalysis.blogspot.com/2013/04/metals-in-electronic-cigarette-vapor.html>

<sup>12</sup> Burstyn, I. "Peering through the mist: systematic review of what the chemistry of contaminants in electronic cigarettes tells us about health risks." *BMC Public Health Journal*, January 2014.

<sup>13</sup> Goniewicz, M., et. al. "Levels of selected carcinogens and toxicants in vapour from electronic cigarettes," *Tobacco Control*, March 2013, <http://tobaccocontrol.bmj.com/content/early/2013/03/05/tobaccocontrol-2012-050859.abstract>