

# Hookah and Health in Louisville:

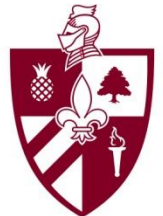
## Why is there cause for concern?

Paul J Kiser, PhD  
Bellarmine University



*“The Caterpillar and Alice looked at each other for some time in silence: at last the Caterpillar took the hookah out of its mouth, and addressed her in a languid, sleepy voice. ‘Who are you?’ said the Caterpillar.”*

- Alice’s Adventures in Wonderland, by Lewis Carroll



BELLARMINE  
UNIVERSITY  
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# What is a hookah?

(shisha, narghile, or argileh water pipes)



ial



Glass Water Bottle







# Hookah Menu

## Hookah Flavor Menu

Kufiya Cafe and Hookah Lounge in Louisville KY offers a large selection of hookah flavors. You have your choice of our traditional or premium tobacco. Stop by and try them all.

Here is Our Simple Menu.\* If you like to combine flavors, just ask, you can combine as many flavors as you like and there are no extra charges!

\* More Flavors are in cafe \*

### TRADITIONAL FLAVORS - \$10.00 Refill \$4.00

- |              |             |       |
|--------------|-------------|-------|
| Mixed Fruit  | Apricot     | Peac  |
| Double Apple | Mango       | Vanil |
| Green Apple  | Orange      | Jasm  |
| Cherry       | Coconut     | Rose  |
| Strawberry   | Lemon       | Mint  |
| Watermelon   | Pineapple   | Lemc  |
| Blueberry    | Banana      | Oran  |
| Sweet Melon  | White Grape |       |
| Raspberry    | Kiwi        |       |
| Blackberry   | Guava       |       |

### PREMIUM FLAVORS - \$12.00 Refill \$5.00

- |                  |                  |       |
|------------------|------------------|-------|
| White Peach      | White Gummy Bear | Pink  |
| Sweet Melon      | Melon Dew        | Straw |
| Orange           | Wild Berry       | Hone  |
| Pineapple        | Tangerine Dream  | Kiwi  |
| Sex on the Beach | Citrus Mist      | Pump  |
| Fuzzy Navel      | Fuzzy Lemonade   | Pass  |
| Raspberry        | Pombery          | Wate  |
| Blueberry        | Blackberry       | Vints |
| Blue Mist        | Cherry           | Flow  |
| Code 69          | Guava            |       |

### HOUSE BLENDS FLAVORS - \$13.00 Refill \$6.00

- |               |              |
|---------------|--------------|
| Midnight Mix  | Alouch Mix   |
| Sunshine      | Fast Mix     |
| Bust A Nutt   | Fruity Mix   |
| Freak Creek   | Ramallah     |
| Arabian Night | Spanish Cove |

### FRESH FRUIT HOOKAH - \$4.00 TO \$7.00

- Apple
- Lemon
- Banana
- Orange
- Pineapple



## About Cafe' 360

3.9 ★★★★★ (810 ratings) Cafe · Coffee Shop

**Address** 1582 Bardstown Rd  
Louisville, Kentucky 40205

**Phone** (502) 473-8694

**Status** Always open

**Price** \$ \$

## Friend's Hookah Cafe

★ ★ ★ ★ ★ 1 review Details

Hookah Bars, Middle Eastern Edit



**1043 Bardstown Rd**  
**Louisville, KY 40204**  
Bardstown Road, Highlands- Cherokee Triangle  
Get Directions  
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Prince Hookah Lounge

WARNING  
The coal on the Hookah is extremely hot. Please do not touch the coal. Prince Hookah will not be held responsible any burns to you or your personal property. Use at your own risk.  
THANK YOU

1489 s 4th st., Louisville, KY.  
(502) 618-4201  
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www.princehookahlounge.com

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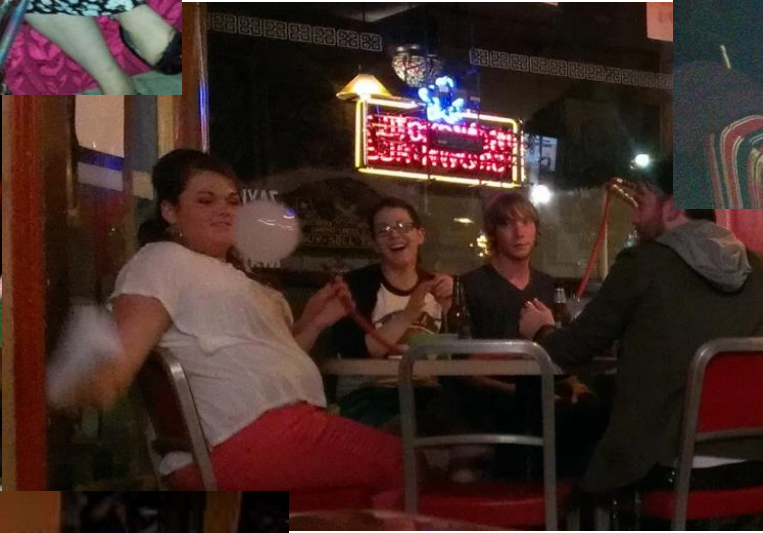
**Hookahville Lounge**  
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Hookah Lounge Now Open!

PT's Showclub  
227 East Market  
Louisville, KY 40202  
(502) 587-7878





# Commonly Heard Hookah Myths

**“Hookah isn’t as addictive as ‘smoking.’”**

**“The water in the pipe filters the smoke.”**

## The Great Hookah Hoax

**“Hookah is just a harmless social activity.”**

**“Hookah is natural”**

Toxin Content of Smoke*			
A single hookah session compared to smoking a single cigarette			
CHEMICAL	HOKAH	CIGARETTE	COMPARISON hookah to cigarette
“Tar”	802.0 mg	22.3 mg	36 times the tar
Nicotine	2.96 mg	1.74 mg	1.7 times the nicotine
Carbon Monoxide	145.0 mg	17.3 mg	8.4 times the carbon monoxide

Sources: Shihadeh & Saleh (2005) Food and Chemical Toxicology Vol 43(5): 655-661  
Djordjevic et al (2000) Journal of National Cancer Institute Vol 92: 106-111

\* We would like to thank Dr. Thomas Eissenberg of Virginia Commonwealth University, who assisted us with the accuracy of this poster and in understanding how to make a fair comparison.







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## Health effects associated with waterpipe smoking

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Accepted 15 January 2015

## ABSTRACT

**Objective** It is widely held that waterpipe smoking (WPS) is not associated with health hazards. However, several studies have documented the uptake of several toxicants and carcinogens during WPS that is strongly associated with harmful health effects. This paper reviews the literature on the health effects of WPS.

**Data sources** Three databases-PubMed, MEDLINE and EMBASE-were searched until August 2014 for the acute and long-term health effects of WPS using the terms 'waterpipe' and its synonyms (hookah, shisha, goza, narghileh, argileh and hubble-bubble) in various spellings.

**Study selection** We included original clinical studies, case reports and systematic reviews and focused on clinical human studies. ~10% of the identified studies met the selection criteria.

**Data extraction** Data were abstracted by all three authors and summarised into tables. Abstracted data included study type, results and methodological limitations and were analysed jointly by all three authors.

**Data synthesis** WPS acutely leads to increased heart rate, blood pressure, impaired pulmonary function and carbon monoxide intoxication. Chronic bronchitis, emphysema and coronary artery disease are serious complications of long-term use. Lung, gastric and oesophageal cancer are associated with WPS as well as periodontal disease, obstetrical complications, osteoporosis and mental health problems.

**Conclusions** Contrary to the widely held misconception, WPS is associated with a variety of adverse short-term and long-term health effects that should reinforce the need for stronger regulation. In addition, this review highlights the limitations of the published work, which is mostly cross-sectional or retrospective. Prospective studies should be undertaken to assess the full spectrum of health effects of WPS, particularly in view of its growing popularity and attractiveness to youth.

and the Western Pacific Region.<sup>4</sup> The perception of safety and harm reduction has been refuted by studies which documented the presence in waterpipe smoke of harmful toxicants and carcinogens<sup>5,6</sup> that are taken in by smokers and not filtered out by the passing through water.

Contrary to this misconception about the safety of WPS, several studies have demonstrated its adverse health effects on many organs but primarily the cardiovascular and respiratory systems where there is documentation of coronary artery disease (CAD) and obstructive pulmonary disease and increased risk to develop lung cancer. In addition, prenatal effects in smoking mothers, periodontal disease and other health effects have been described in this group of smokers. This paper is a narrative review of the current knowledge on the health effects of WPS and it draws recommendations for work needed to determine the scope of disease in this group of smokers and highlights the importance of regulatory measures to curb this rapidly growing epidemic.

## METHODS

**Eligibility criteria** For a comprehensive evaluation of published data on the health effects of WPS, a minimally restrictive approach of study inclusion was adopted. All available original clinical studies (cohort, case-control and cross-sectional), systematic reviews, case reports and case series were included. Relevant abstracts and full text studies were also included. In vitro and animal studies were included but were not the main focus of this study. Publications that were not eligible were letters and editorials that did not represent original research, or publications that did not assess our main outcomes of interest, that is, effects or outcomes of WPS on human health.

## Search strategy

PubMed, MEDLINE and EMBASE databases were searched from the earliest studies on those databases until 27 August 2014. A medical librarian was consulted and agreed with the search strategy used. The PubMed search was carried out using a strategy employing synonyms of 'waterpipe': waterpipe OR hookah OR shisha OR goza OR narghileh OR argileh OR hubble-bubble. MEDLINE was searched using previously reported strategies,<sup>7</sup> which helped identify further studies not found using the former strategy. EMBASE was searched using a modified version of the MEDLINE search, namely searching for terms in titles and abstracts only, including only English language hits for the term "goza", and combining the search terms "water pipe" or "argil" with the term "tobacco". This resulted in a more focused retrieval of studies from EMBASE, since applying the non-modified



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## A review of air quality, biological indicators and health effects of second-hand waterpipe smoke exposure

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## ABSTRACT

**Objective** There has been a rapid increase in the use of waterpipe tobacco and non tobacco based shisha in many countries. Understanding the impact and effects of second hand smoke (SHS) from cigarette was a crucial factor in reducing cigarette use, leading to clean indoor air laws and smoking bans. This article reviews what is known about the effects of SHS exposure from waterpipes.

**Data sources** We used PubMed and EMBASE to review the literature. Articles were grouped into quantitative measures of air quality and biological markers, health effects, exposure across different settings, different types of shisha and use in different countries.

**Study selection** Criteria for study selection were based on the key words related to SHS: waterpipe, hookah, shisha and third hand smoke.

**Data extraction** Independent extraction with two

reviewers yielded 54 articles, of which only 11 were included based on relevance to SHS from a waterpipe/hookah/shisha.

**Conclusions** The negative health consequences of second-hand waterpipe exposure have major implications for clean indoor air laws and for occupational safety. There exists an urgent need for public health campaigns about the effects on children and household members from smoking waterpipe at home, and for further development and implementation of regulations to protect the health of the public from this rapidly emerging threat.

US Department of Health and Human Services, which estimated that 60% of US non-smokers are exposed to SHS.<sup>2</sup> Exposure occurs through several distinct routes: sidestream smoke, mainstream smoke, or smoke that has permeated the air of the surrounding environment. Sidestream smoke is the smoke discharged from the lit end of a burnt tobacco product; mainstream smoke is the smoke that is inhaled by a smoker and subsequently exhaled into the environment during a period of active smoking.<sup>3</sup> Another route of exposure by non-smokers is third-hand smoke (THS), which is defined as the residual matter from tobacco smoke that collects on surfaces and in dust.<sup>4</sup> While SHS and THS have historically been associated with cigarette smoke, there has recently been an alarming rise in alternative non-cigarette tobacco use, raising the important question of whether these products also generate harmful SHS and THS.

**Data synthesis** A primary literature search yielded 54 articles, of which only 11 were included based on relevance to SHS from a waterpipe/hookah/shisha. This is worrisome given national Youth Tobacco Survey<sup>5</sup> prevalence of waterpipe use in the USA (roughly 2 million youth also showed that 53.1% in a home with a hookah user). Another recently published representative sample from the USA showed that adolescents in low-income families and who had a history of pregnancy were more likely to use hookah. Another recently published study showed that adolescents in low-income families and who had a history of pregnancy were more likely to use hookah. Another recently published study showed that adolescents in low-income families and who had a history of pregnancy were more likely to use hookah. Another recently published study showed that adolescents in low-income families and who had a history of pregnancy were more likely to use hookah.

exposure, which highlights the need for additional research on home exposure and populations that may be at particular risk of exposure within the home, such as children.<sup>11</sup>

## METHODS

We conducted a primary literature search in two separate databases; PubMed and EMBASE. We used the following search terms:

*passive smoking, second hand smoke, second hand smoker, second hand smokers, second-hand smoke, third hand smoke, waterpipe, waterpipes, water-pipe, water-pipes, hubble-bubble, hookah narghile, shisha, qalyan.*

We combined the list of articles found from the two databases. Two reviewers went through the title and abstract of each article for relevance. We

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Kumar SR, et al. *Tob Control* 2014;13:e2038. doi:10.1136/tobaccocontrol-2014-052038

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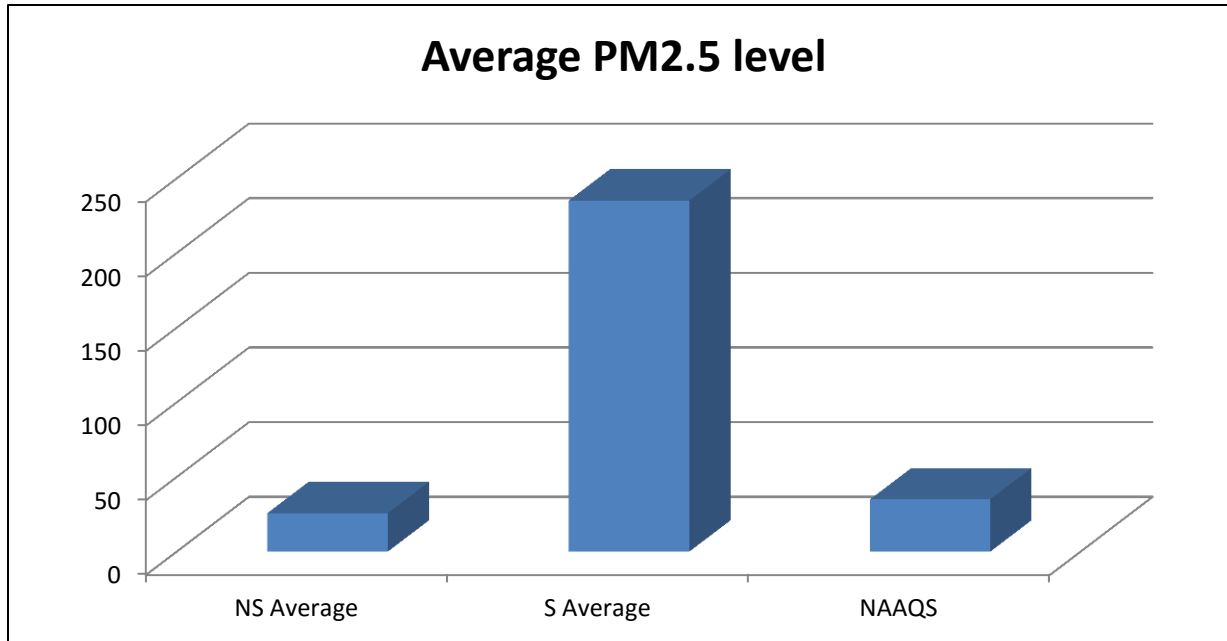


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Sumit R Kumar  
et al. *Tob Control* 2014;13:e2038



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# Louisville Hookah Lounge Air Quality



Air quality data showing average (in  $\mu\text{g}/\text{m}^3$ ) concentration of respirable particulate matter (PM2.5 = air particulates smaller than  $2.5\mu\text{m}$ ) in indoor air samples from non-smoking bars/ restaurants and those that allow hookah smoking in Louisville, KY. The third column shows the National Ambient Air Quality Standard for PM2.5 in outdoor air ( $35\mu\text{g}/\text{m}^3$  - there is no federal indoor air quality standard).

# But What About the Herbal Shisha?



## Acute effects of waterpipe tobacco smoking: A double-blind, placebo-control study<sup>☆</sup>

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Overall, results from this double-blind, placebo-control study demonstrate that waterpipe tobacco smoking produces some effects likely due to nicotine (e.g., cardiovascular response) and some effects likely due to other factors (e.g., subjective experience). Importantly, nicotine- and non-nicotine factors may be involved in the development of tobacco dependence in cigarette smokers (e.g., Eissenberg, 2004; Brandon et al., 2004), thus waterpipe tobacco smokers may also be at risk for dependence (Maziak et al., 2004). Future work is needed to delineate these factors in waterpipe smokers and understand better their role in waterpipe dependence. Also notable is the observation that using a waterpipe to smoke a non-tobacco product results in a substantial level of CO exposure that did not differ from that observed when smoking tobacco under identical conditions. Some waterpipe smokers may believe that non-tobacco products can be used to reduce exposure to smoke toxicants (Roskin and Aveyard, 2009). However, while nicotine exposure is clearly eliminated, CO exposure is not. Moreover, charcoal is the source of CO and carcinogenic PAHs (Monzer et al., 2008) in waterpipe smoke. Thus, aside from dependence, the health risks of using a waterpipe to smoke non-tobacco preparations may be similar to those of smoking tobacco whenever charcoal is the heat source.

### ABSTRACT

**Background:** Waterpipe tobacco smoking usually involves heating flavored tobacco with charcoal and inhaling the resulting smoke after it has passed through water. Waterpipe tobacco smoking increases heart rate and produces subjective effects similar to those reported by cigarette smokers. These responses are thought to be nicotine-mediated, though no placebo-control studies exist. Accordingly, this double-blind, placebo-control study compared the acute physiological and subjective effects of waterpipe tobacco smoking to those produced when participants used a waterpipe to smoke a flavor-matched, tobacco-free preparation.

**Method:** Occasional waterpipe tobacco smokers ( $n=37$ ; 2–5 monthly smoking episodes for  $\geq 6$  months) completed two double-blind, counterbalanced sessions that differed by product: preferred brand/flavor of waterpipe tobacco or flavor-matched, tobacco-free preparation. For each 45-min, ad lib smoking episode blood and expired air CO were sampled, cardiovascular and respiratory response were measured, and subjective response was assessed.

**Results:** Waterpipe tobacco smoking significantly increased mean ( $\pm$ SEM) plasma nicotine concentration ( $36 \pm 0.7$  ng/ml) and heart rate ( $8.6 \pm 1.4$  bpm) while placebo did not ( $0.1 \pm 0.0$  ng/ml;  $1.3 \pm 0.9$  bpm). For carboxyhemoglobin (COHb) and expired air CO, significant increases were observed for tobacco ( $3.8 \pm 0.4\%$ ;  $27.9 \pm 2.6$  ppm) and for placebo ( $3.9 \pm 0.4\%$ ;  $27.7 \pm 3.3$  ppm) with no differences across condition. Independent of condition, symptoms of nicotine/tobacco abstinence (e.g., "urges to smoke", "anxious") were reduced and direct effects (e.g., "dizzy", "satisfy") increased.

**Discussion:** These results from the first placebo-control study of waterpipe tobacco smoking demonstrate that waterpipe-induced heart rate increases are almost certainly mediated by nicotine though the subjective effects observed in these occasional smokers were not.

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...le have smoked tobacco using a shisha); inhalation of charcoal, travels down the body, and before reaching smokers' lungs

(World Health Organization, 2005). While often associated with southwest Asia, waterpipe tobacco smoking is now seen worldwide

<sup>☆</sup> All work was performed at Virginia Commonwealth University.  
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E-mail address: [teissenb@vcu.edu](mailto:teissenb@vcu.edu) (T. Eissenberg).

(e.g., Pärna et al., 2008; Jensen et al., 2010). In the U.S., for example, past 30-day waterpipe tobacco smoking has been reported by 9–20% of some college samples (Cobb et al., 2010). A survey of 8745 students from 8 universities revealed that 7.2% reported past 30-day use and 29.5% reported "ever use" (Primack et al., 2010). Past 30-day use among 14–18 year old Arab-Americans may be as high as 16% and non-Arab-Americans as high as 11% (Weglick et al., 2007).

One reason for the global spread of waterpipe tobacco smoking may involve the oft-reported belief that waterpipes are less risky than cigarettes (Aljarrah et al., 2009; Smith-Simone et al., 2008). This belief seemingly is contradicted by demonstrations that various constituents of waterpipe smoke are known to cause cancer (e.g., polycyclic aromatic hydrocarbons [PAH]; Sepetdjian et al., 2008), lung disease (e.g., volatile aldehydes; Al Rashidi et al., 2008).

# It doesn't matter!



Health agencies are virtually  
unanimous...

AMA, AAP, ALA, ACS, AHA, CDC, FDA,  
WHO, NCTFK, and many more...

...All agree hookah is a growing public health  
threat, especially to minors and young adults, and  
must be regulated immediately.

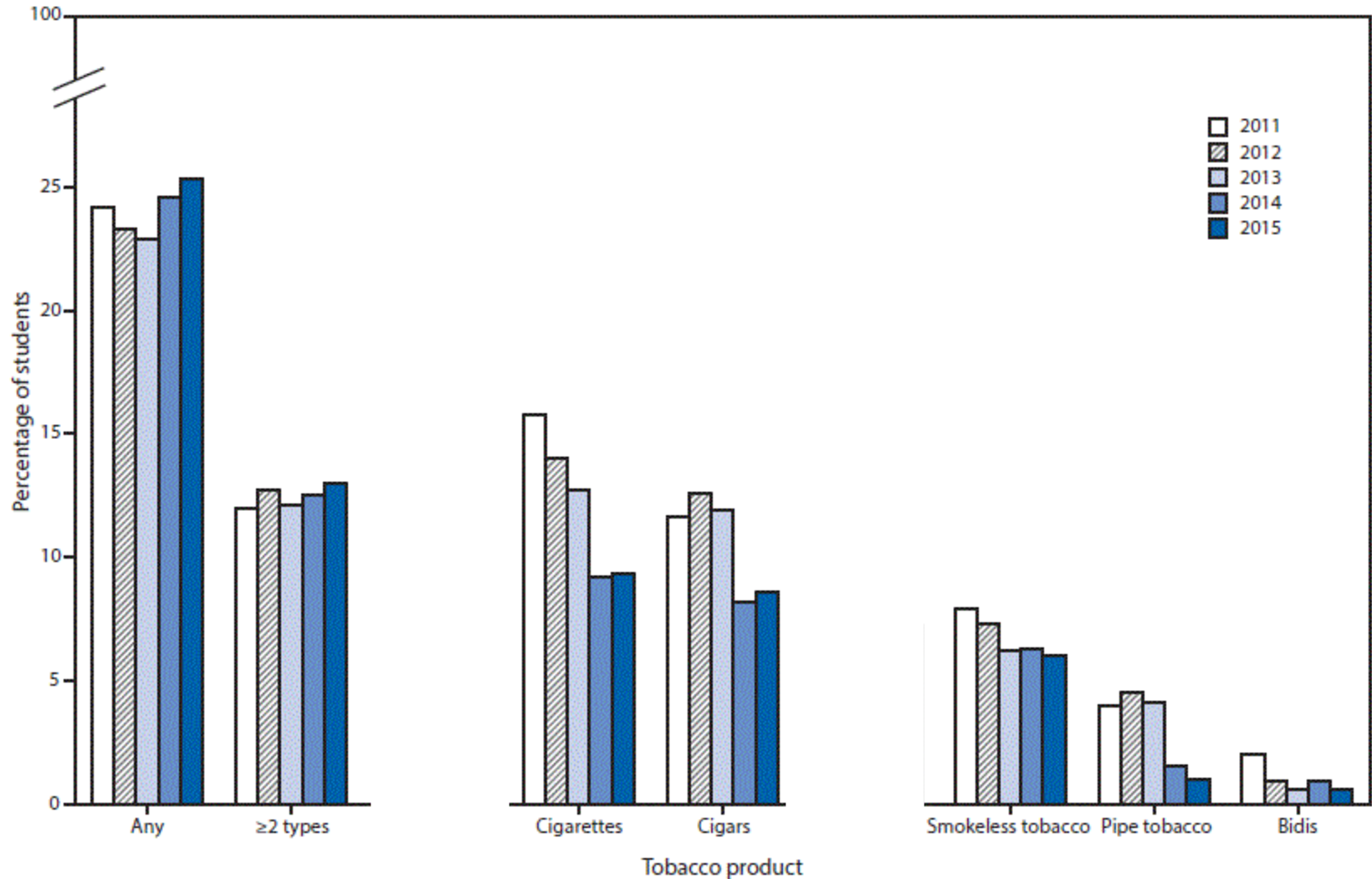
The nicotine industry is adapting much faster than  
the health advocates ever can.

# **Tobacco Use Among Middle and High School Students — United States, 2011–2015**

*MMWR / April 15, 2016 / 65(14); 361-367*

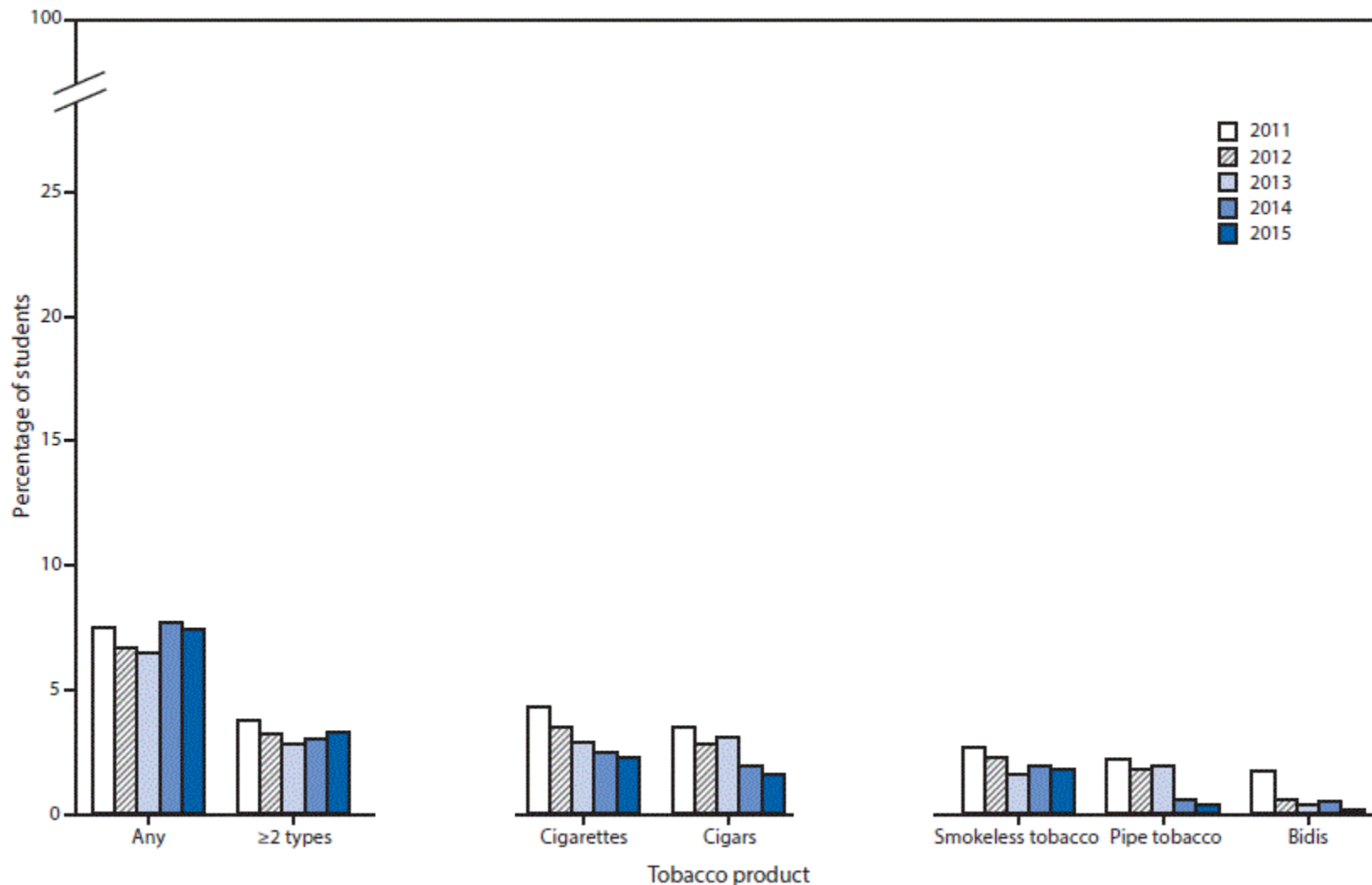
Tushar Singh, MD, PhD; René A. Arrazola, MPH; Catherine G. Corey, MSPH; Corinne G. Husten, MD;  
Linda J. Neff, PhD; David M. Homa, PhD; Brian A. King, PhD

**FIGURE 1. Estimated percentage of high school students who currently use any tobacco products,  $\geq 2$  tobacco products, and select tobacco products — National Youth Tobacco Survey 2011–2015**





**FIGURE 2. Estimated percentage of middle school students who currently use any tobacco products,  $\geq 2$  tobacco products, and select tobacco products in the past 30 days — National Youth Tobacco Survey, 2011–2015**





# Analysis of Greater Louisville University Student Usage of Hookah and Electronic Cigarettes and Attributed Perceptions of Risk

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## INTRODUCTION

Hookah's popularity is rising as a stim being advertised to young adults as a smoking cigarette. Hookah lounges a social outlet similar to that of tradition college students too young to drink a (flavored tobacco smoked in a hookah p as much nicotine as tobacco toun cigarette. Accordingly, increasing num similar to those associated with ar cigarette have been reported in shleah cigarette (e-cig/vaping) users. These inc of cancers, heart disease and periodon gums) along with novel respiratory d increasingly prevalent popcorn lung.

Over the past decade, numerous comr have passed restrictions on the indc products in public spaces. However, pri that electronic cigarette development and availability of hookah is a very recen items have not been included in any rest on their marketing or public consump have been recently passed by state gover



Figure 1. Local universities in the Louisville (gray) are mapped along with surrounding and vapor stores' (green).

Vapor stores for this study were considered to be stores that ONLY sell e-cigarette products. General convenience stores that sell conventional tobacco products and other goods were omitted.

## CONCLUSIONS

1 – The perception of risk of hookah usage is significantly different between users and non-users at Indiana University – Southeast, while there is no difference between users and non-users at Bellarmine University.

2 – Between student hookah users of both campuses, BU users have a lower perception of hookah risk compared to hookah users at IUS.

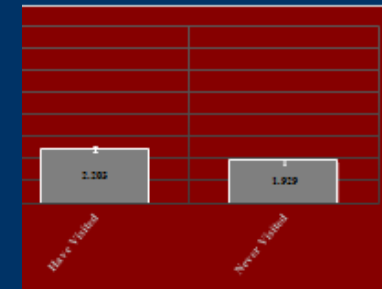
3 – While E-cigarette users show a significant difference in perception of risk of using e-cigarettes compared to non-users, there are no differences when comparing between students on BU and IUS campuses.

4 – Without regard for campus students who have visited a hookah lounge at least once have a lower perception of hookah usage risk when compared to non-users.

to Louisville universities as compared to the level of city lounges near IUS, it is probable that the heavy marketing and availability of hookah lounges influences BU students to become desensitized to the risks of hookah. IUS students, who are located much farther away from retail outlets, are not as heavily impacted by these same factors.

college students as appears to be the case with hookah lounges in Louisville. Thus, perceptions of e-cigarette risk are likely to not be as varied between both campuses compared to hookah risk.

## Perceptions of Hookah Risk Based on Lounge Visitation



4. Summary of the results of an ANOVA conducted ng whether or not students had ever visited a hookah correlated with their perception if smoking tobacco in is less dangerous than smoking cigarettes (with 1 strongly do not believe' and 5 being 'I strongly

e who have visited a hookah lounge are ntly more likely to perceive less risk of hookah compared to conventional cigarette. It is uncertain itation is causative in reducing perceived risk or if perceived risk increases the likelihood of visiting a lounge. However, physical proximity to a hookah would likely make a potential visitation easier.

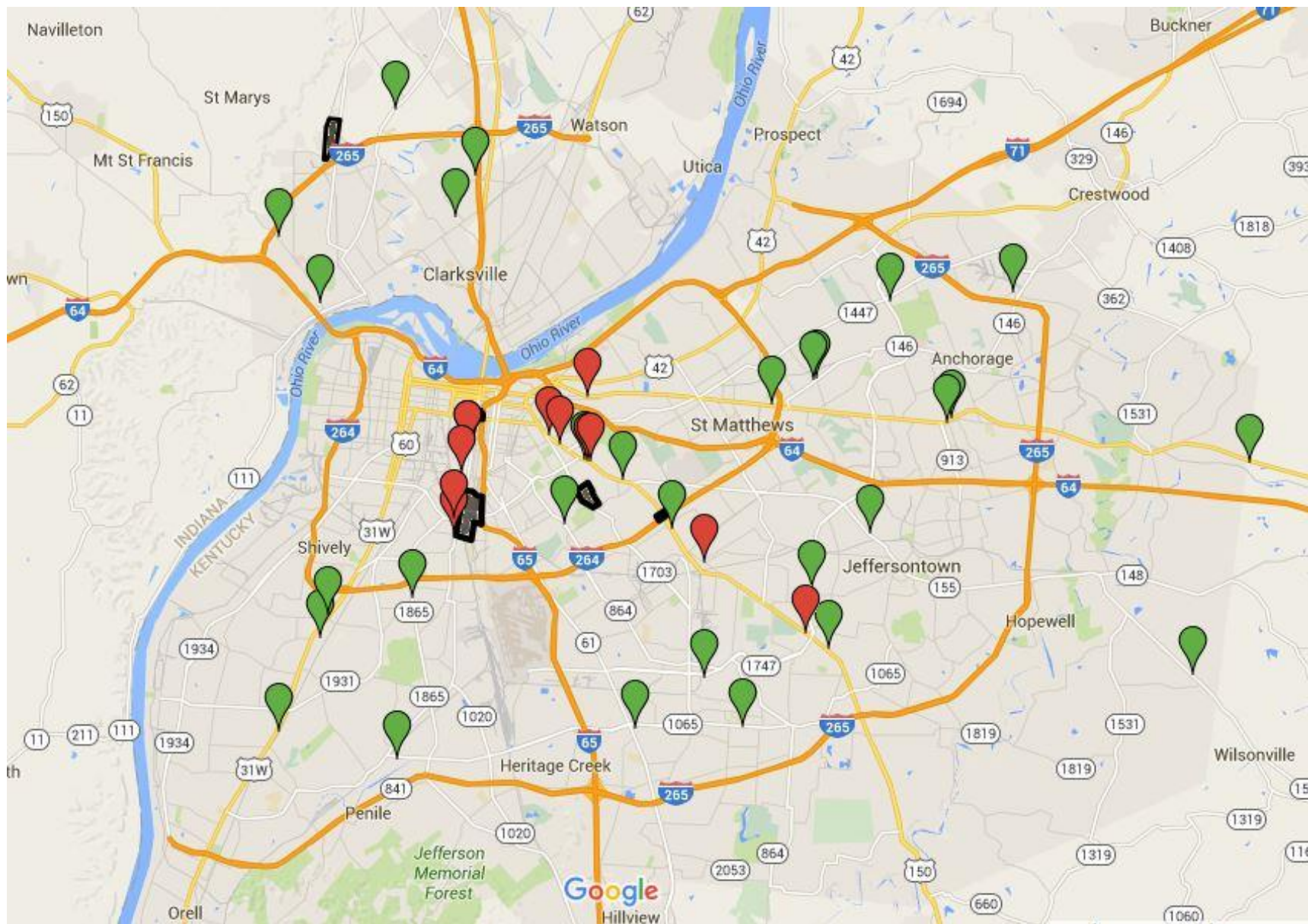
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# Final Thoughts

- Hookah is a health risk as significant as smoking cigarettes
- Secondhand smoke from hookah is hazardous and is prevalent in establishments that allow indoor hookah use
- Health risks from hookah are found in both tobacco and herbal shisha blends
- Youth consumption of hookah and e-cigs has increased significantly in the last 5 years
- Louisville Metro student perceptions of risk from the use of hookah and e-cigs appear to be negatively influenced by proximity and availability of those products

# Final Thoughts

- Exemptions to smokefree policies:
  - Go against the science and evidence
  - Normalize the addictive behavior
  - Fail to protect everyone
  - Treat employees in exempted establishments as second-class citizens
  - Are extremely difficult to enforce
  - Do NOT provide any economic benefit to the community
  - Picks “winners/losers” and creates opportunities for legal challenges (Remember our own previous experiences??)

# Final Thoughts

To protect the health of everyone at their workplaces, I strongly recommend that hookah and e-cigarettes be included in the Louisville Metro smokefree ordinance\* thereby treating them as a health risk equal to other tobacco products and prohibiting their consumption in all indoor public spaces.

\*Lou. Metro Am. Ord. No. 1-2008, approved 1-11-2008



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