

WATER PIPE, e-CIGARETTES

„THE HEALTHIER SMOKING ???

<https://is.muni.cz/www/2422/um>



Gregory N. Connolly:

- ◆ THE 20th CENTURY WAS THE CIGARETTE CENTURY.
- ◆ NOW, THE 21st CENTURY IS ABOUT MULTIPLE TOBACCO PRODUCTS.
- ◆ THEY ARE CHEAP, FLAWORED.
- ◆ AND SOME OF THEM YOU CAN USE ANYWHERE

WATER PIPE

- ◆ Waterpipe, Narghile, Arghile, Shisha, Hookah, Goza, Hubble – Bubble
- ◆ HISTORY: in ASIA, NORTH. AFRICA
- ◆ MIDDLE EAST
- ◆ WIDE SPREAD ON NORTH HEMISPHERE : young, university students
- ◆ Smoking by cca 100 MILLIONS PEOPLE

PREVALENCE of USERS

- ◆ USA 12-15 %
- ◆ ESTONIA 25 %
- ◆ LIBANON 25 %
- ◆ SYRIE 25.5 %
- ◆ PAKISTAN 50 %
- ◆ TURKISH 40 %
- ◆ CZECH REP. 37 % (70 % up to 25 y)

ČR – MEDICAL STUDENTS (GHPSS 2011/12)

◆	3rd ČR	6th LFMU
No of respondents	706	220
Have tried (%)	79.3	82.2
During last month	19.2	5.9
At home	9.8	6.8
In tea house	33.8	36.1
In friends' home	34.5	38.4

FILLING

- ◆ VERY DIFFERENT; most often
- ◆ 30 % TOBACCO (Ma'assel): MELASA, SUGAR, HONEY, FRUIT
- ◆ Tumbal, Urak
- ◆ CHARCOAL (source of CO, benzin, PAU)
- ◆ DEEPER INHALATION

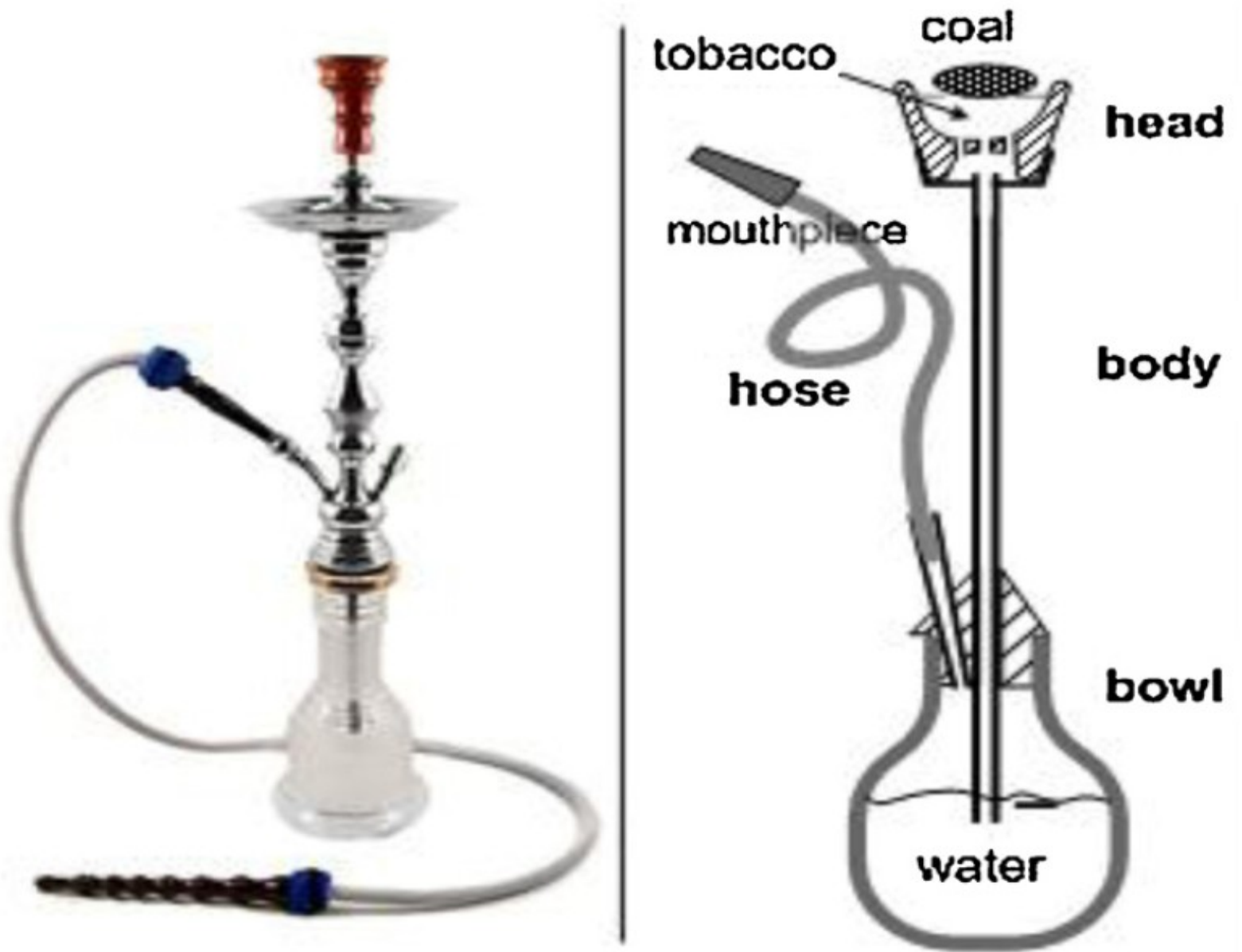


Fig. 1. Waterpipe picture (left) and schematic showing main parts (right).

TYPES of SMOKING

- ◆ **INDIVIDUAL:** 30 – 60 min, > 100 (až 170) puffs; inspiration 2.6 sec; 2.8 x/min => 530 ml of air
- ◆ 3 mg nicotin, 800 mg tar, 145 mg CO,
242 mg dust particles
- ◆ **IN GROUP:** common mouthpiece – infection

IS IT SAFFER THAN CIGARETTES?

WATER FILTR ABSORBES :

- Formaldehyd64.7 %
- Acetaldehyd 74.6 %
- Aceton 80.1 %
- Acrolein71.6 %
- Propionaldehyd 64.5 %
- Butylaldehyd 58.2 %

BUT!!! TOXICOLOGY

◆ MATTER	WP : CIG. RATE
PAH	8 – 45
FORMALDEHYD	6 – 9
ALDEHYDES	2 – 14
TAR	8 – 53
NICOTIN	1 – 5
CO	6 – 15
ARSEN	1 – 4
CHROMIUM	19 – 333
LEAD	80 – 200
NITROSAMINES, PRIM. AROM. AMINES, ACROLEIN, RESPIR.DUST	

TOXICOL. - FENOLS

- ◆ Production temperat. 350-600° C;
- ◆ 3 – 1000 times more than from cigarette
- ◆ EFFECTS:
- ◆ Toxic (cardiovascular)
- ◆ Promotion of cancer
- ◆ Promotion of lung cancer metastases
- ◆ Genotoxic activity

MARKERS of EXPOSURE

- ◆ Nicotin serum from 1.1 - > 60.3 ng/ml
saliva from 1.1 - > 624.7 ng/ml

Cotinin urine from 73.6 - > 249 mg/l/day

PAH, NNAL in urine

Chromosomal aberation, sister chromatids
exchange higher than in cigarette smokers

Dose-response relationships

HEALTH CONSEQUENCES

- ◆ ADDICTION (behavioural, physical)
- ◆ LUNG CANCER.....OR 2 - 6
- ◆ HEAD/NECK CANCER..... OR 4 - 5
- ◆ MOUTH DYSPLASIA OR 8.33
- ◆ OESOPHAGEAL CANCER ...OR 1.85
- ◆ PARODONTITIS OR 3 - 5

HEALTH-continue

- ◆ Metabolic sy.OR 3.21
- ◆ Hypertriglyceridemia OR 1.63
- ◆ < HDL OR 1.75
- ◆ Hyperglykemia..... OR 1.82
- ◆ Hypertension..... OR 1.95
- ◆ Abdominal obesity OR 1.93
- ◆ Ac.cardiovascular response as for cigarettes

HEALTH -continue

Respiratory d., coron.d.OR 2.3

- ◆ Dry sucs after tooth extraction... RR 3
- ◆ InfertilityOR 2.5
- ◆ Complication of gravidity
- ◆ Low birthweight OR 2.12
- ◆ Oxidative stress

CASUISTIC

- ◆ AC. POISONING by CO (man, 19y) WITH HEARTH SYNCOPE and VISUS DISORDERS
- ◆ COHb 32.7 %
- ◆ INVERZE WAVE T (ECG)
- ◆ Also in another studies levels of COHb in water pipes smokers are high (20-30 %)

DEPENDENCE

- ◆ LIBANON „WATERPIPE DEPENDENCE SCALE“
- ◆ BUYING THE WATER PIPE FOR DOMESTIC USE – IS IT THE FIRST MARKER OF DEPENDENCE (?)

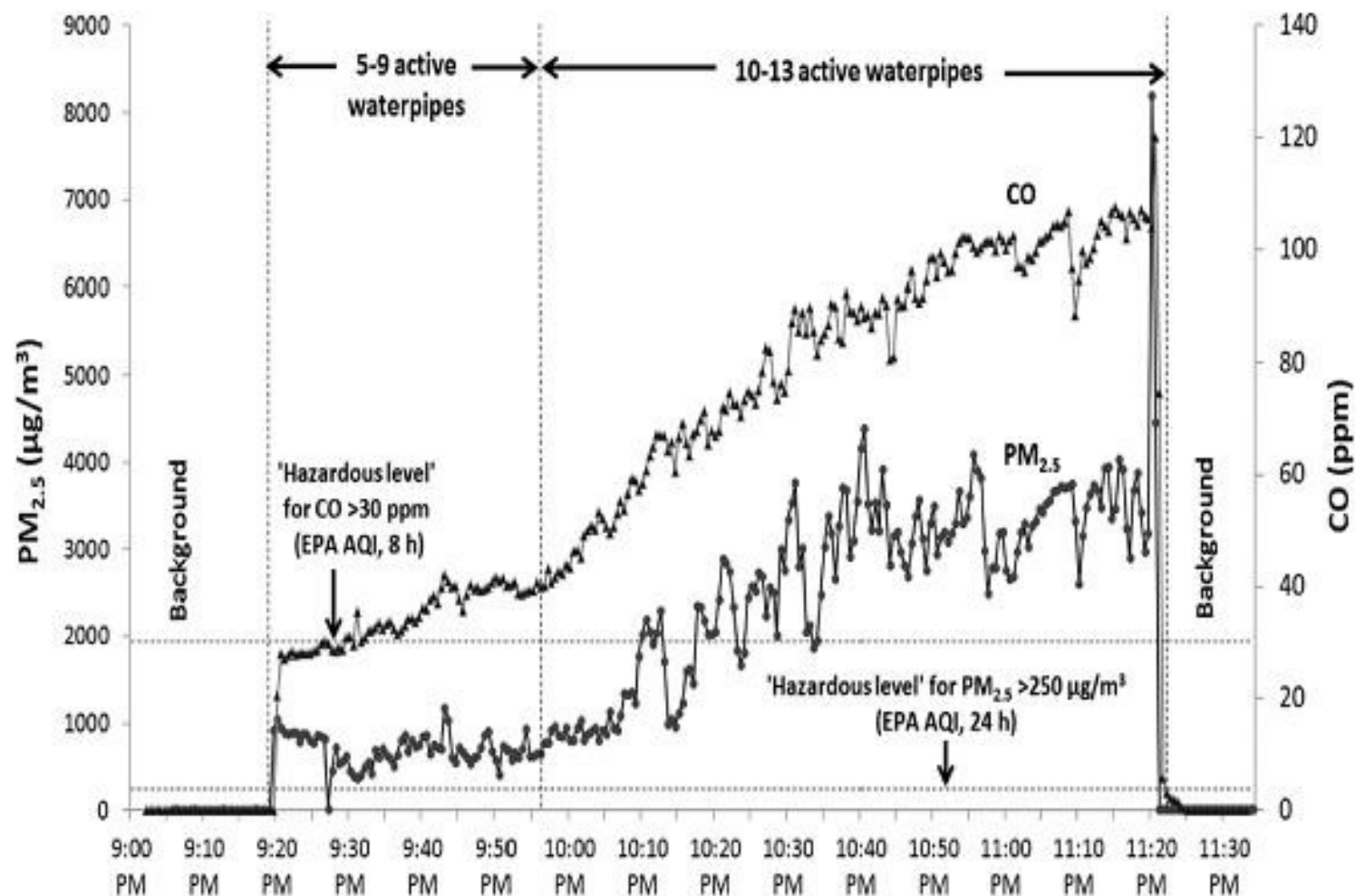


Figure 1 Real-time air quality measures of PM_{2.5} (µg/m³) and carbon monoxide (CO) (ppm) for one indoor waterpipe cafe with the highest mean value of CO, measured on 21 September 2012, Toronto Waterpipe Study. Mean values were 67 ppm for CO, 2039 µg/m³ for PM_{2.5}, 7.9 µg/m³ for air nicotine, and 9.4 for active waterpipes, during 123 min measurement session.



NOTICES

- ◆ RESULTS FROM STUDIES ARE DIFFERENT – INFLUENCED BY
 - BURNING MIXTURES
 - EXCHANGING OF WATER
 - WAYS and FREQUENCY of SMOKING



Water Tobacco Cigarette Pipe



Level

HOOKAH STEAM STONES

- ◆ Porous stones with glycerine
- ◆ Burning in water pipe
- ◆ Sources of smoke from propandiol/ glycerol
- ◆ Emissions from charcoat (CO, PAH)

The advertisement features a central hookah with pink steam stones. Surrounding it are several jars of Pure Steam Stones in various flavors, including Strawberry, Blueberry, and Peach. A grid of 15 small images shows different flavor options. At the bottom left, three bottles of Pure Mix e-liquids are displayed. The text 'PURE Steam Stones' is prominently displayed in the center, and 'PURE MIX' is written in a large, stylized font at the bottom left. The website 'www.purestones.com' and phone number '1(855) 846-6524' are at the bottom.

The healthy way of shisha.

Indulge in pure flavor.

PURE Steam Stones

PURE MIX

www.purestones.com 1(855) 846-6524

Figure 1 Steam stones are used in place of tobacco in hookahs. Pure brand steam stone marketing refers to steam stones as “the healthy way to shisha”.

ADVERTISING

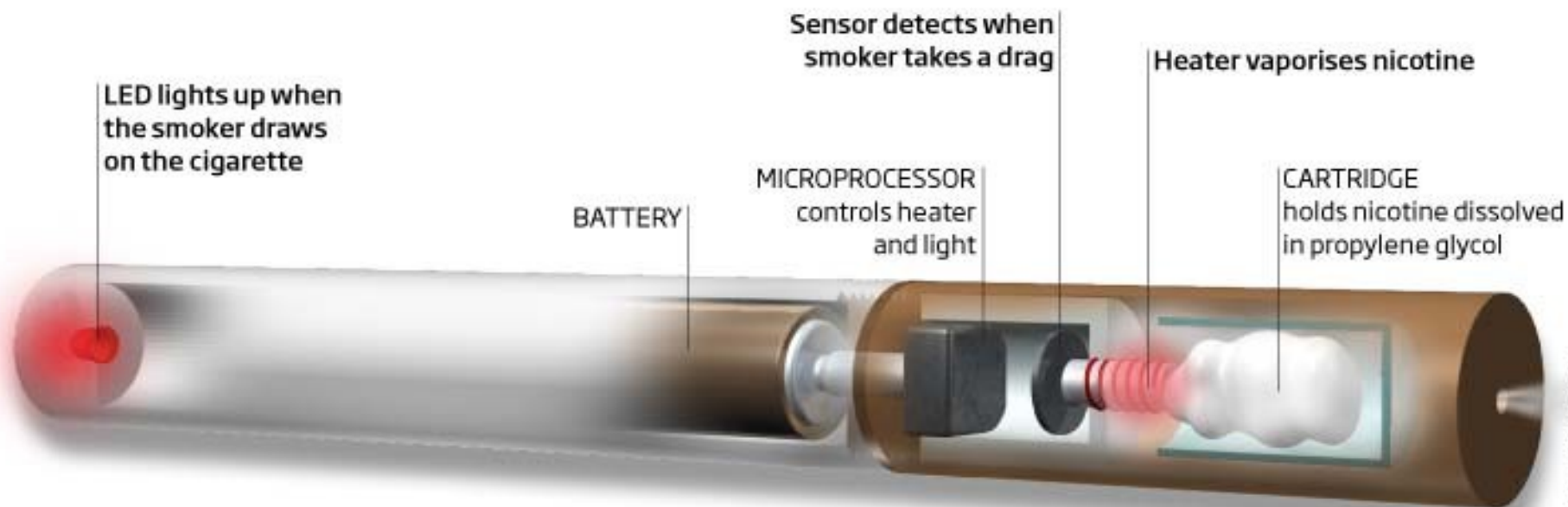
- ◆ „SAFE SMOKING“
- ◆ TOBACCO LAW FREE
- ◆ LIKE SWEETS, CHEWING GUMS
- ◆ EXPORT FROM GERMANY, UK,
- ◆ YOUNG ARE VERY INTERESTED

E-CIGARETTES

- ◆ Electronic Nicotine Delivery Systems
- ◆ 1993 China, like classic cigarette (pipe, cigar)
- ◆ Contemporarily cca 200 sorts
- ◆ Widespread: 2012 sold 3,5 mil. pieces
- ◆ (a) SMOKING CESSATION
- ◆ (b) SMOKING ON PUBLIC PLACES

Smoke without fire

Suck on an e-cigarette and it produces a cloud of nicotine-carrying vapour with none of the toxic by-products of burning tobacco



TECHNIC PARAMETERS

- ◆ CONTAIN: nicotine, propylenglykol / glycerin, additives (menthol, chocolade, fruits)
- ◆ Self- filling by smokers ! (liquid)
- ◆ TEMPERATURE cca 60° C
- ◆ (classic cigarette 600 - 900° C)

PRODUCTION

- ◆ SMALL MANUFACTURES, LOW STANDARD
- ◆ REAL LEVELS ARE DIFFERENT FROM DECLARATED LEVELS (FDA's measurements)
- ◆ 95 % are produced in China

NEW INTEREST by

- ◆ BIG TOBACCO, including
- ◆ ALTRIA (Philip Morris: Regulatory Toxicology and Pharmacology)
- ◆ ADVERTISING similar as for classic cigarettes:
sophisticated, freedom, individualism, ...

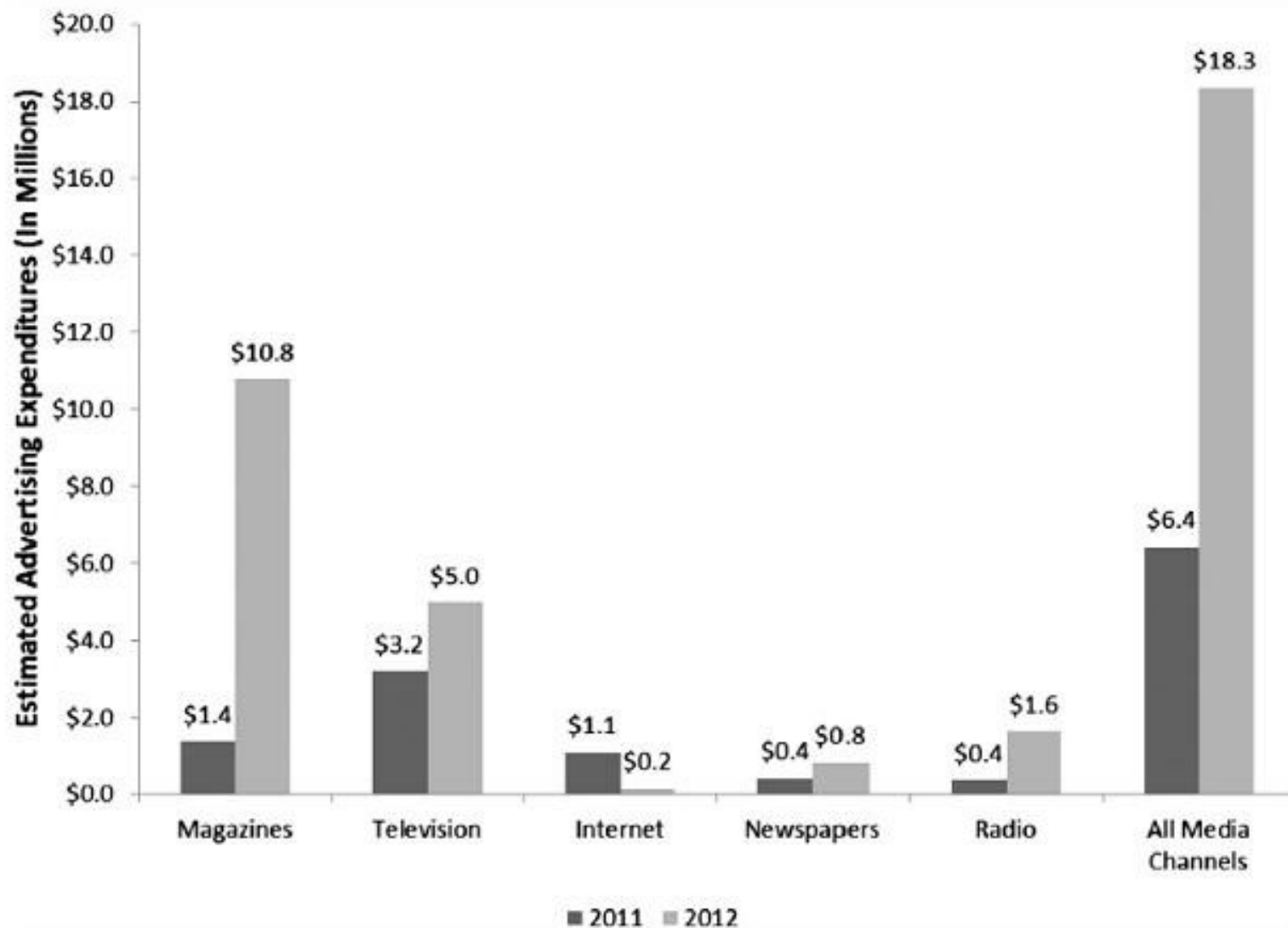


Figure 1. E-cigarette advertising expenditures by media channel, Kantar Media and Nielsen Ad*Views, 2011–2012

DISTRIBUTION

- ◆ International Tobacco Control Four-Country Survey 2013:
- ◆ KNOWN: 46.6% (US 73, UK 54, Ca 40, Au 20)
- ◆ HAVE TRIED: 7.6%
- ◆ REGULAR USERS: 2.9%

- ◆ In ČR (2010) have tried 6.7% over 15 y
- ◆ SOCIAL TRENDS: young, higher income



REASONS FOR USING



- ◆ 75.4% REDUCTION OF SMOKING
- ◆ 85.1% SMOKING CESSATION
- ◆ 79.8% BELIEVED ABOUT SAFETY

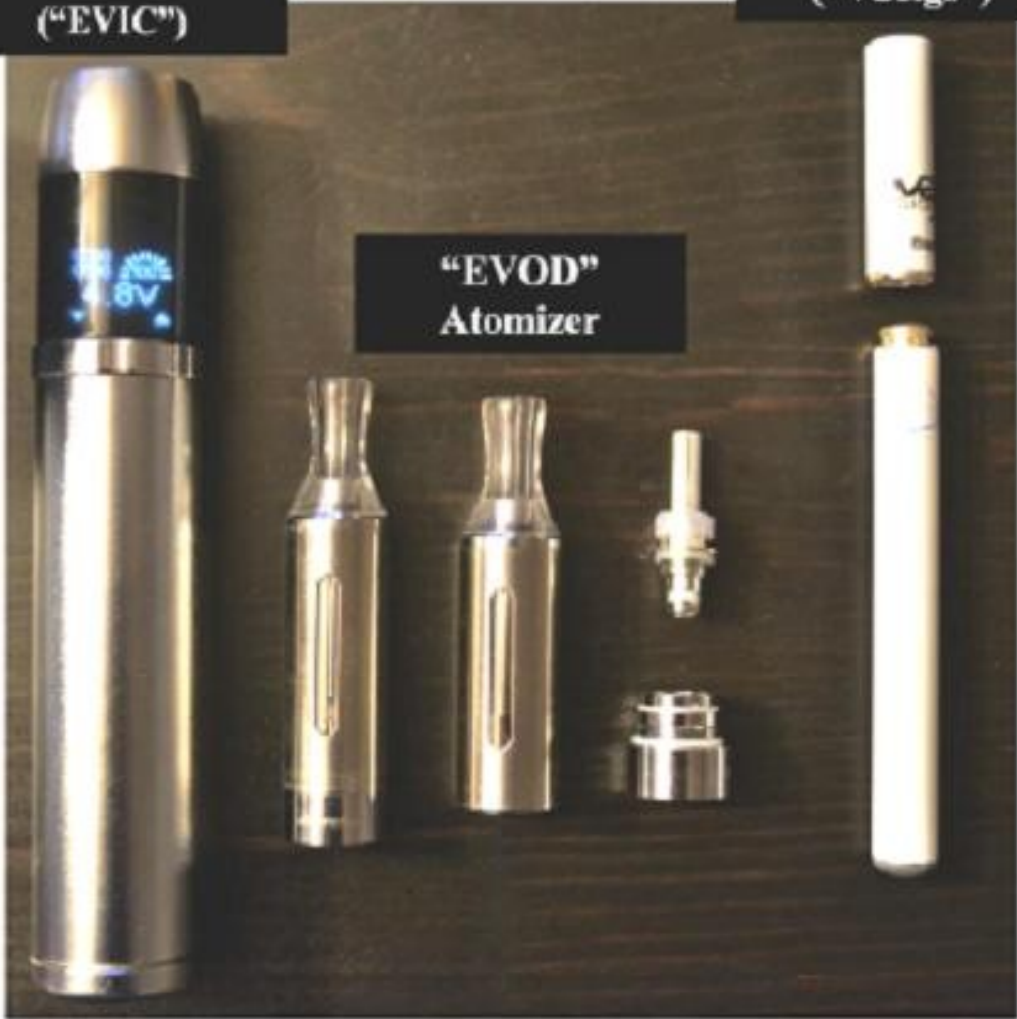
NICOTINE

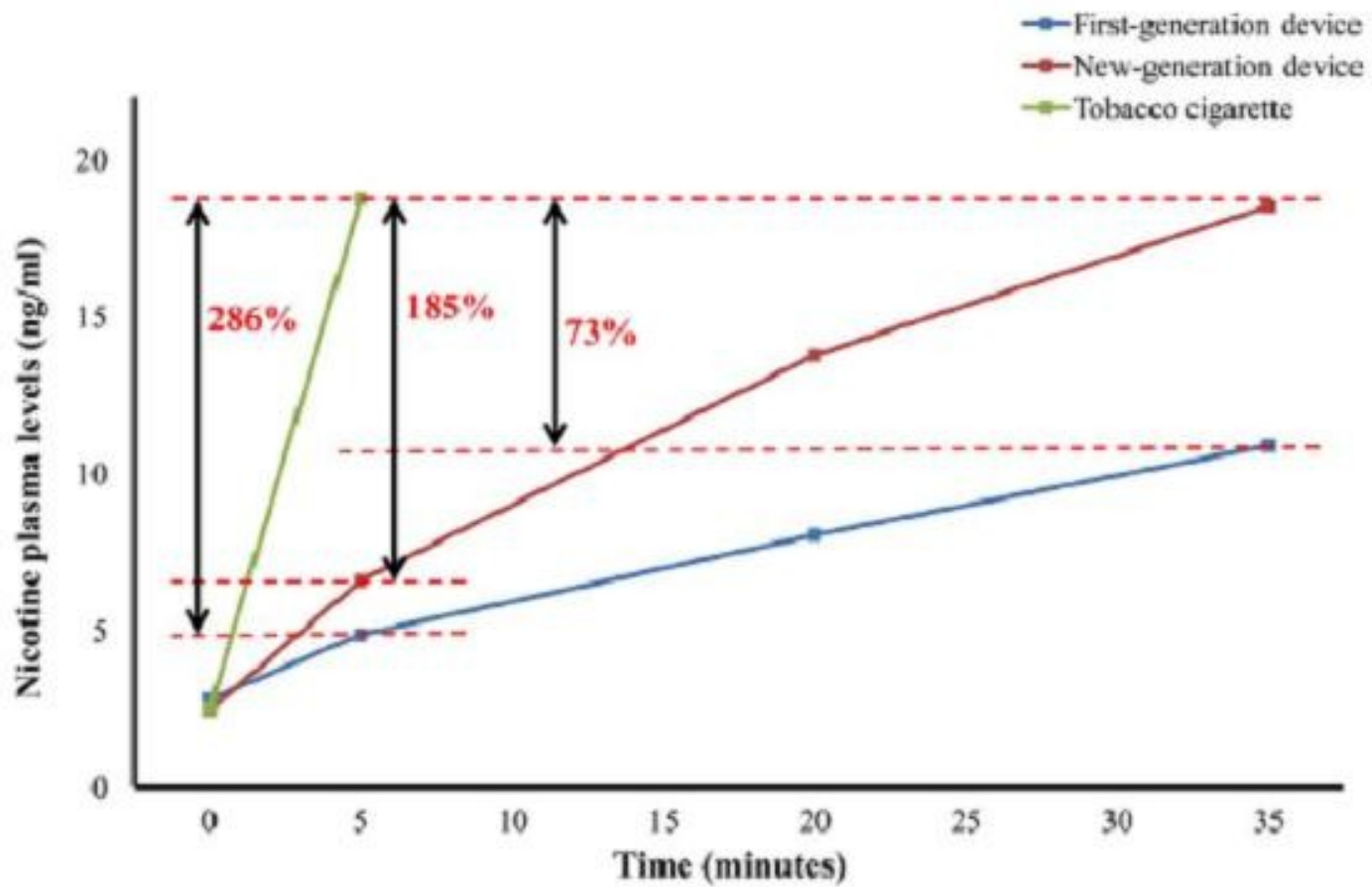
- ◆ Volume 5, 10, 20 ml
- ◆ Nicotine concentr. 0 – 20 mg/ml
- ◆ Even the smallest cartridge (5ml) can contain 100 mg nicotine
- ◆ Letal dosis 10 mg (children),
30-60 mg (adults)

**New generation
device
("EVIC")**

**First generation
device and
cartomizer
("V2cigs")**

**"EVOD"
Atomizer**





RESPIRABLE PARTICLES

◆ CONVENTIONAL C.

$4 \times 10^9 / \text{cm}^3$

◆ E-CIGARETTES:

$4.39 \times 10^9 / \text{cm}^3$

CORRELATTE WITH
NICOTINE CONC.,
and LENGHT OF
PUFF

OTHER CHEMICALS (aerosol)

- ◆ DI-ETHYLEN GLYKOL
- ◆ PARTICLES of Ag, Fe, Ni, Al, Sn, Si
- ◆ NANOPARTICLES Sn, Cr, Ni
- ◆ CONCENTRATIONS OF THESE CHEMICALS ARE HIGHER THAN IN CLASSIC CIGARETTES

MORE OTHER CHEMICALS

- ◆ NITROSAMINES
- ◆ ACETALDEHYD, ACETON
- ◆ FORMALDEHYD
- ◆ CHLORINATED POLYCYKCLIC H.
- ◆ POLYCYCLIC AROMATIC H.

FOR PASSIVE SMOKERS

◆ INDOOR ETS

- Levels of ammonia lower by 41 %
- Particulate matters lower by 80 – 90 %
- CO as in non-smoking environment
- Nicotine as in non-smoking environment

FOR USERS:

- EFFECTS FOR SMOKING CESSATION - CONTROVERSIAL
- NICOTINE CAN PRODUCE DIFFERENT PHYSIOLOG., TOXICOLOG. and ADDICTIVE EFFECTS
- ◆ AC. HEART and LUNG RESPONSE as classic cigarettes
- ◆ CHR. EFFECTS – NOT KNOWN
- ◆ DEVELOPMENT OF DEPENDENCE

IN VITRO

- ◆ EXTRACTS FROM DIFFERENT e-CIG. PRODUCED CYTOTOXIC EFFECTS ON CARDIOMYOBLASTS,
- ◆ SIMILARLY AS CLASSIC CIGARETTES

Farsalinoc et al., Int J Environ Res Publ Health 2013; 10 (10)

SIDE EFFECTS

- ◆ HEADACHE,
- ◆ NAUSEA
- ◆ IRRITATION (mouth, bronchi)
- ◆ DRY MOUTH
- ◆ LIPOID PNEUMONIE (aspiration of glycerinu)

3 ON-LINE SOURCES

- ◆ 405 DIFFERENT SYMPTOMS
 - 78 POSITIVE
 - 326 NEGATIVE
 - 1 NEUTRAL

Hua M et al. J Medical Internet Research, 2013; www.jmir.org/2013/4/e59

USERS' COMMENTS:

- ◆ LESS TOXIC
- ◆ SMELL-FREE
- ◆ FREEDOM
- ◆ NO ASH
- ◆ NO FIRE
- ◆ SOURCE of NICOTINE
- ◆ LOWER „CRAVING“
- ◆ BAD QUALITY
- ◆ SHORT LIFE of BATERIE
- ◆ TOO EXPENSIVE
- ◆ BAD TASTE
- ◆ LOW INFORMATIONS
- ◆ BACK TO CIGARETTES

E-CIGARETTES for CESSATION

◆ USING E-CIGARET:

- Longer time
- Short time
- No using

2.758 clients of 6 „quit lines“

◆ 7 Months

ABSTINENCE:

- 21.7 %
- 16.6 %
- 31.3 %

Vickerman KA et al., Tobacco
Research 2013; May 8

SPECIALISTS' STATEMENT:

- ◆ **Another tobacco product, not treatment drug**
- ◆ Danger of poisoning (alimentary, transdermal)
- ◆ Support the behavioral dependence
- ◆ Further research of effects is necessary
- ◆ Not legal in Canada, Australia
- ◆ Legal in USA, UK
- ◆ **Not permitted for smoking on public places, and**
- ◆ **For sale to minors**

CONCLUSSION 1

- ◆ WATER PIPES and E-CIGARETTES ARE PERCIEVED AS SAFE SMOKING
- ◆ IT IS NECESSARY TO CONFIRM or REFUSE IT by SERIOUS RESEARCH
- ◆ USING DECREASES COMMON EFFORT TO REDUCE NICOTINE/ TOBBACO INTAKE

CONCLUSION 2

- ◆ NICOTINE IS:
- ◆ COMPLETE CARCINOGEN (due to its genotoxic metabolite NNK; direct epigenetic influence on promotion, proliferation and expansion)
- ◆ HUMAN TERATOGEN (brain development, programming)
- ◆ POTENT ADDICTION DRUG

DĚKUJI ZA POZORNOST

