

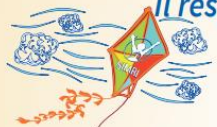
Ti ricordiamo che questo materiale  
è di proprietà dell'Autore.  
Come partecipante al  
**XXVIII CONGRESSO NAZIONALE SIMRI**  
questo materiale ti è fornito da SIMRI  
per esclusivo uso personale  
concesso dall'Autore

# Stili di vita, ambiente e malattie respiratorie



## XXVIII CONGRESSO NAZIONALE SIMRI

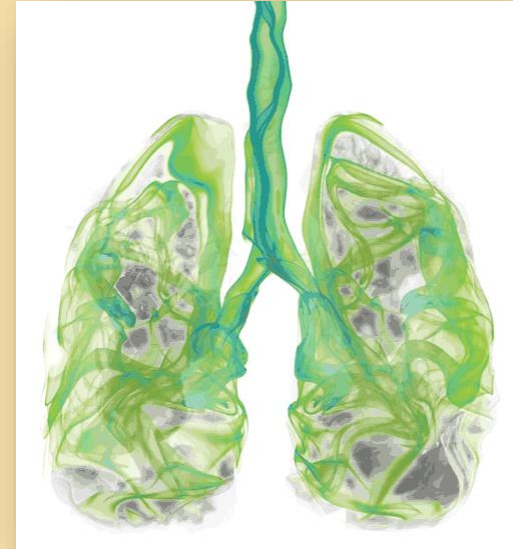
*Il respiro: scienza e terapia per la salute del bambino*



Programma



Torino, 10-12 ottobre 2024



*E-cigarette: un  
pericolo sin  
dall'adolescenza*



*Maria Elisa Di Cicco*



# Tutto comincia da qui...



The harmful components of tobacco cigarette smoke (at least 70 carcinogens and 250 known to be harmful) are products of **incomplete combustion (pyrolysis)** and the **degradation of tobacco cigarettes through heat (thermogenic degradation)**

The majority of smoke toxicants are generated here



# Tutto comincia da qui...

QUANDO ENTRAVI IN UN BAR



E NON ERA VIETATO FUMARE

Le leggi hanno *limitato la vendita e l'utilizzo delle sigarette...*

**FEWER PEOPLE ARE USING  
TOBACCO COMPARED  
TO THE YEAR 2000.**



WHO, Jan 2024



ABOUT 1 IN 5 ADULTS USE  
TOBACCO NOW, WHEREAS  
IT WAS 1 IN 3 IN 2000

**ENDS**  
*(electronic nicotine delivery systems)*

**E-cigarettes**  
**(2006)**

**Heat not  
burn (2014)**



**SVAPO**  
**(vape)**

# Il fumo elettronico: un grande bluff?

*“They arrived with **great promise**. It does not burn, it is not tobacco, it must be better. It feels like **deja vu**. We have been there before with tobacco products promoted as conferring reduced harm - but did not - from **filter** cigarettes (the “advanced” Kent Micronite filter contained asbestos) to “**low tar and low-nicotine** cigarettes” (which were no less harmful).*

***The latest in the chain of “reduced harm” products are electronic cigarettes...”***



*Farber HJ et al. The fallacy of electronic cigarettes for tobacco dependence.*

*Ann Am Thorac Soc. 2024 Oct; 21(10): 1372-4*

## Electronic cigarettes: “wolves in sheep’s clothing”



*Chong-Silva DC et al. J Pediatr  
2024 Sep 5: S0021-7557(24)00*

*The Lancet Regional Health-Europe. Lancet  
Reg Health Eur. 2024 Jul 1; 42: 100997*



## E-cigarettes: public health saviour or Trojan Horse?

# The nicotine and tobacco epidemic among adolescents: new products are addicting our youth

Heinly A, Walley S.  
Curr Opin Pediatr.  
2023; 35: 513-21

<p>Combustible Tobacco Products</p>	<p>Cigarettes, cigars/cigarillos, pipes, hookah, and bidis</p>	
<p>Electronic Nicotine Products</p>	<p>Electronic cigarettes <b>2006</b></p>	
	<p>Heated tobacco products <b>2014</b></p>	

# The nicotine and tobacco epidemic among adolescents: new products are addicting our youth

Traditional  
Smokeless  
Tobacco  
Products

Chewing tobacco, dip,  
snuff and snus



New Oral  
Nicotine  
Products

Nicotine pouches,  
gum, lozenges, tablets,  
and gummies

2016



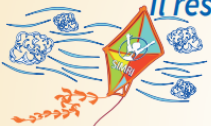
# E-cigarette: un pericolo sin dall'adolescenza



## XXVIII CONGRESSO NAZIONALE SIMRI

*Il respiro: scienza e terapia per la salute del bambino*

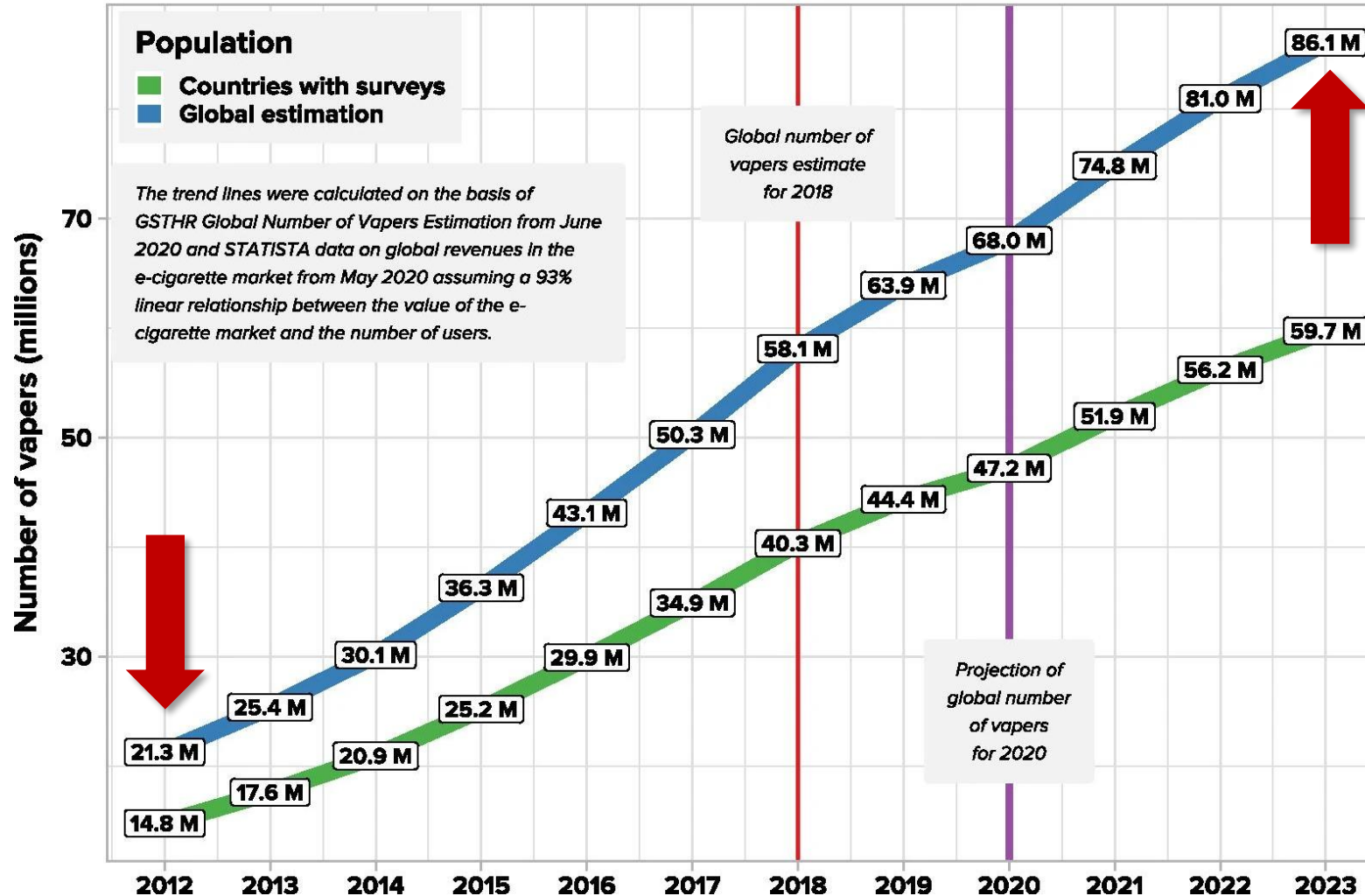
Programma



Torino, 10-12 ottobre 2024

- **Dimensioni del problema**
- Cosa sono le e-cig?
- Gli effetti sulla salute
- Come proteggere i ragazzi?

# I numeri di questa pandemia



Ministero della Salute

**12,4 milioni** di fumatori  
(24,2%)

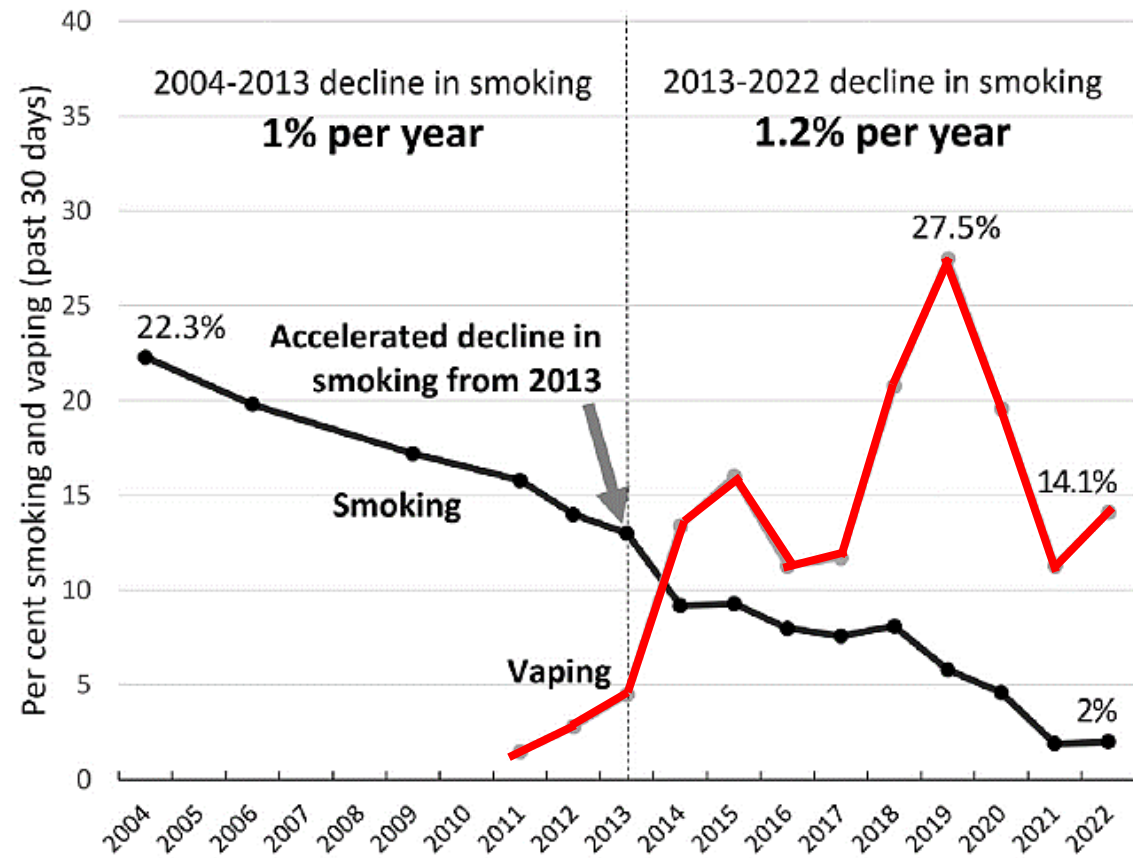
**1,2 milioni** di utilizzatori  
abituali o occasionali di e-  
cig (2,4%) e **1,7 milioni**  
per HTP (3,3%)

# L'epidemia da svapo, soprattutto tra gli adolescenti



## Cigarette smoking and Vaping, US High schoolers

National Youth Tobacco Surveys (CDC)  
Grades 9-12, ages 15-18 | Past 30-day use



**SVAPO**

**SIGARETTA**

# National Youth Tobacco Survey - 5 Settembre 2024



**1.63 million** U.S. middle and high school students currently used e-cigarettes

# La situazione in Italia

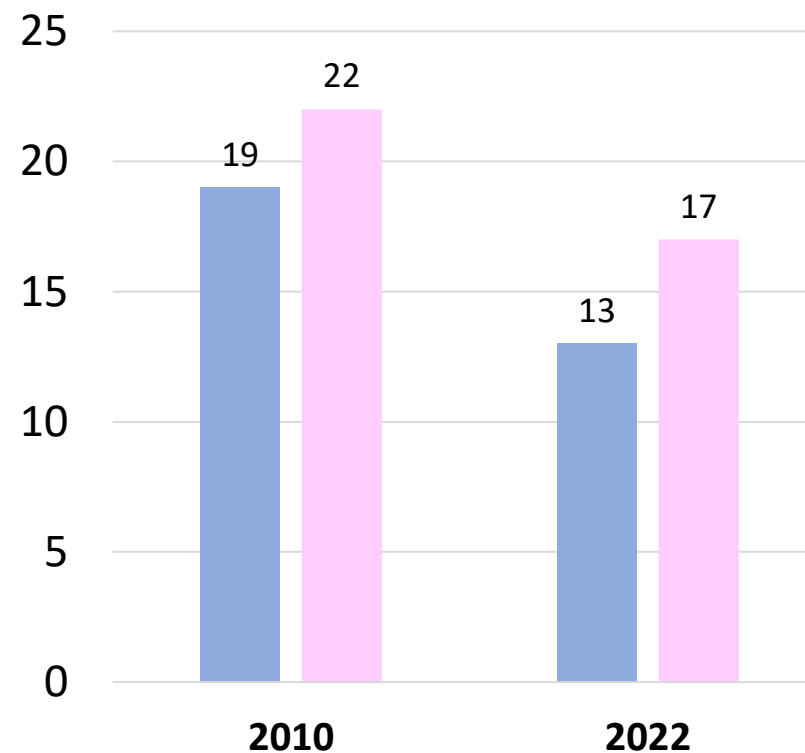


## DATI ISS Maggio 2023 - Studenti 13-15 anni

<b>1 su 4</b>	Ha usato almeno una volta nell'ultimo mese un prodotto tra <b>sigarette, e-cig e prodotti a tabacco riscaldato</b>
<b>1 su 3</b>	Ha fumato una <b>sigaretta tradizionale</b> almeno una volta nella vita.
<b>2%</b>	<b>Utilizzo esclusivo di sigarette tradizionali</b> (la grande maggioranza fa un uso concomitante di sigarette tradizionali, e-cig e prodotti a tabacco riscaldato)

*Non sufficiente adesione al divieto di fumo nelle scuole, forte esposizione dei ragazzi al fumo passivo, a casa o in auto, e una grande accessibilità a tutti i prodotti*

### Current smokers



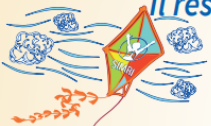
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*Il respiro: scienza e terapia per la salute del bambino*

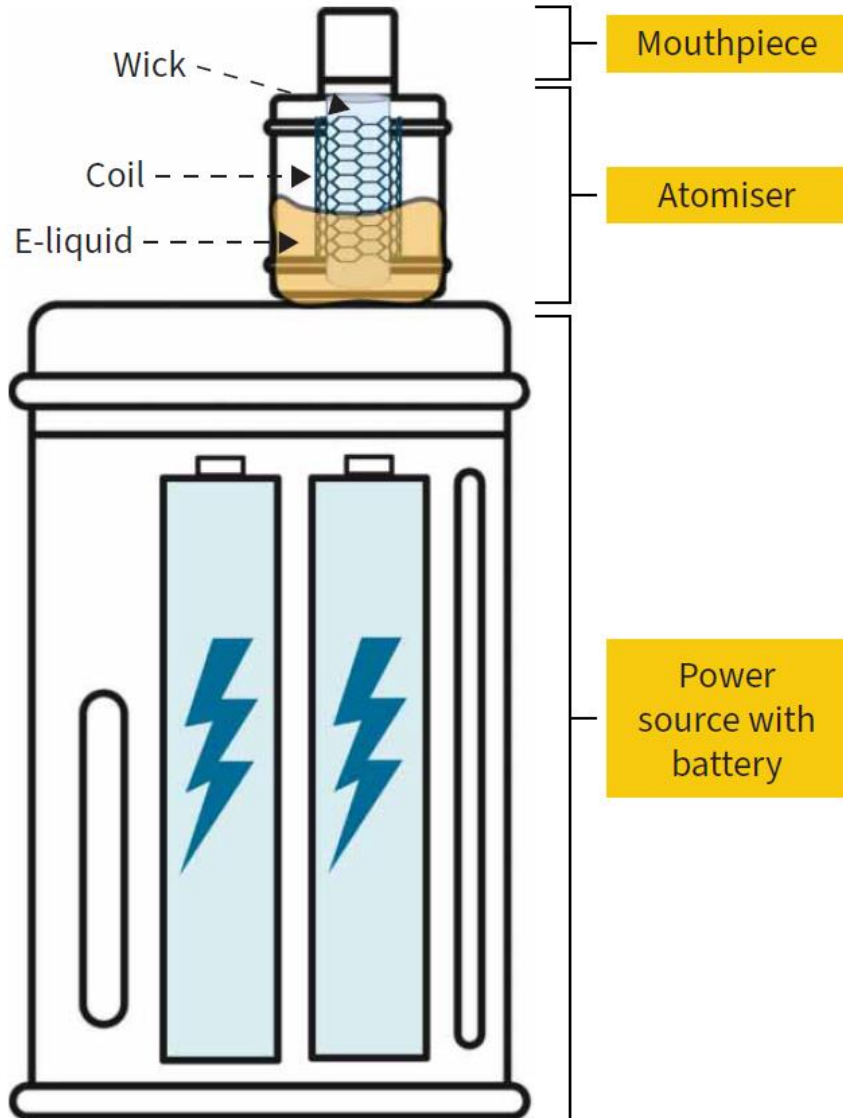
Programma



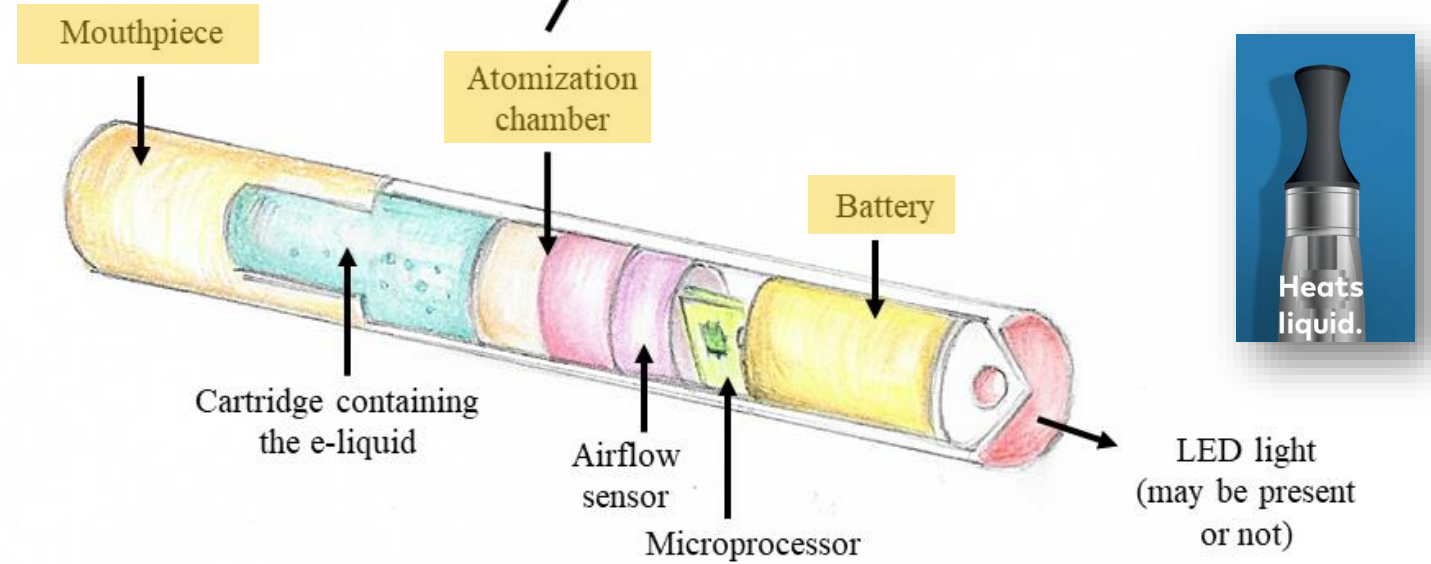
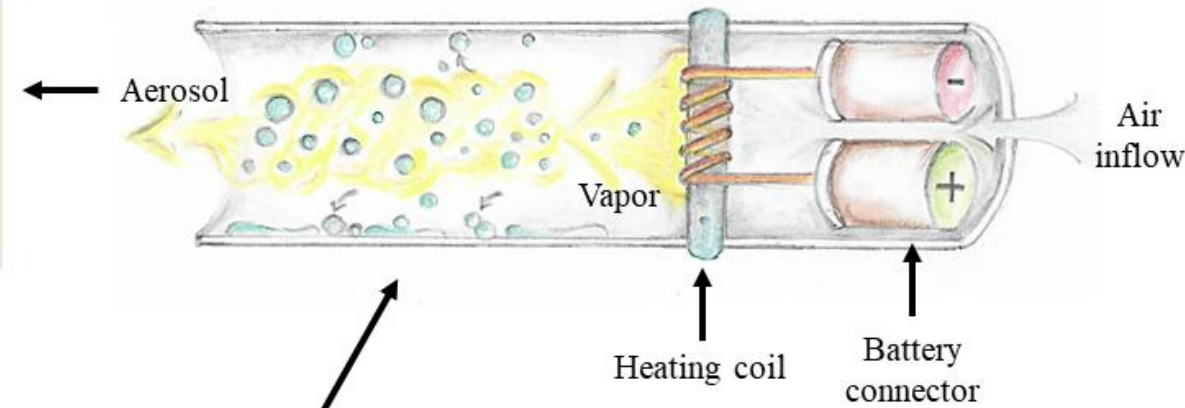
Torino, 10-12 ottobre 2024

- Dimensioni del problema
- **Cosa sono le e-cig?**
- Gli effetti sulla salute
- Come proteggere i ragazzi?





# La sigaretta elettronica

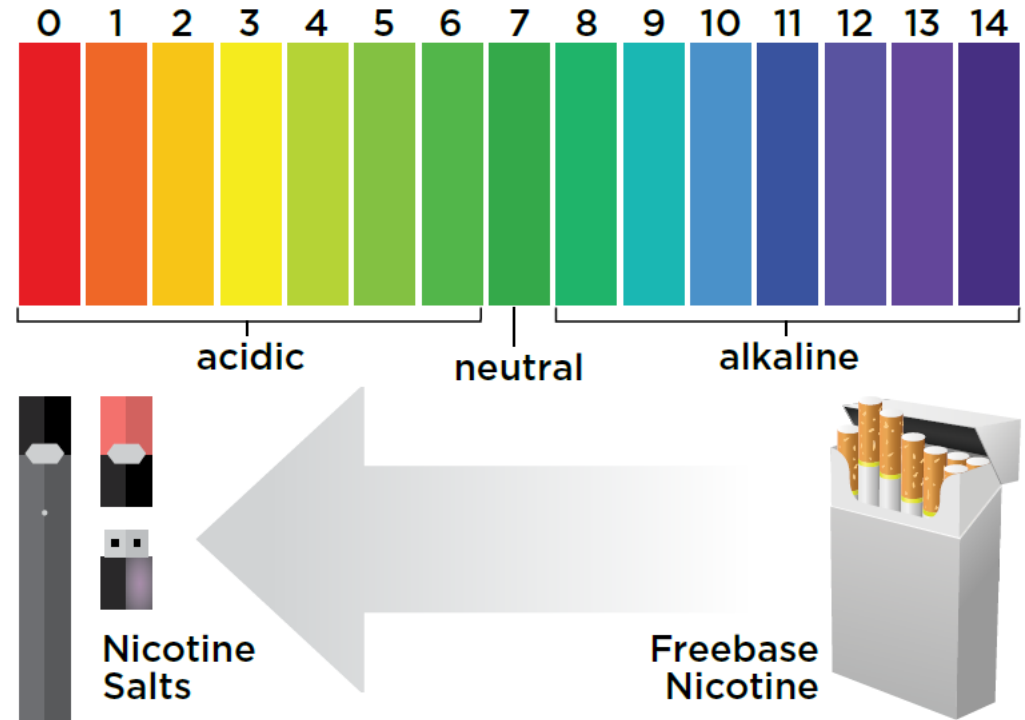


- Carbonyl compounds
- Nicotine; tobacco specific nitrosamines
- Particulate matter
- VOCs
- Metals
- Other toxic agents



# Le 4 generazioni di e-cig

2005-2010		<b>1<sup>st</sup></b> GENERATION	Disposable e-cigarettes
Dal 2010		<b>2<sup>nd</sup></b> GENERATION	E-cigarettes with prefilled or refillable cartridge
Dal 2010		<b>3<sup>rd</sup></b> GENERATION	Tanks or Mods (refillable)
Dal 2015		<b>4<sup>th</sup></b> GENERATION	Pod Mods (prefilled or refillable)



For accessibility, explanation of graphic can be found in [Appendix, page 25](#).

## Pod Mods

- Pod Mods typically use nicotine salts rather than the freebase nicotine used in most other e-cigarette, or vaping, products.
- Nicotine salts, which have a lower pH than free base nicotine, allow particularly high levels of nicotine to be inhaled more easily and with less irritation to the throat than freebase nicotine.

# L'ultima tendenza dei dispositivi da svapo: le sigarette elettroniche usa e getta si diffondono in Italia

Attualmente in Italia esistono **più di 800 tipi diversi** di e-cig monouso che si differenziano per marca, aroma e quantità di nicotina.



Le e-cig monouso, contengono tra il **2% e il 5%** di nicotina, sotto forma di nicotina a base libera o di sali di nicotina. Il **2% di nicotina** (20 mg/ml) significa che in **una sigaretta elettronica monouso riempita con 2 ml di e-liquid ci sono 40 mg di nicotina**. Pertanto, svapando una sigaretta elettronica da 600 puff, l'utilizzatore assorbe la stessa quantità di nicotina che avrebbe assorbito fumando circa **40** sigarette tradizionali.

# L'ultima tendenza dei dispositivi da svapo: le sigarette elettroniche usa e getta si diffondono in Italia

Attualmente in Italia esistono **più di 800 tipi diversi** di e-cig monouso che si differenziano per marca, aroma e quantità di nicotina.



*Das M. Lancet Oncol. 2024 Oct 3*

### Approval of single-use e-cigarettes ban in France

On Sept 25, 2024, the European Commission approved France's bid to ban single-use or disposable e-cigarettes.

Disposable e-cigarettes are designed to be used only once, and the devices—that come pre-filled with a liquid—are not refillable or rechargeable. Disposable e-cigarettes have rapidly become popular among

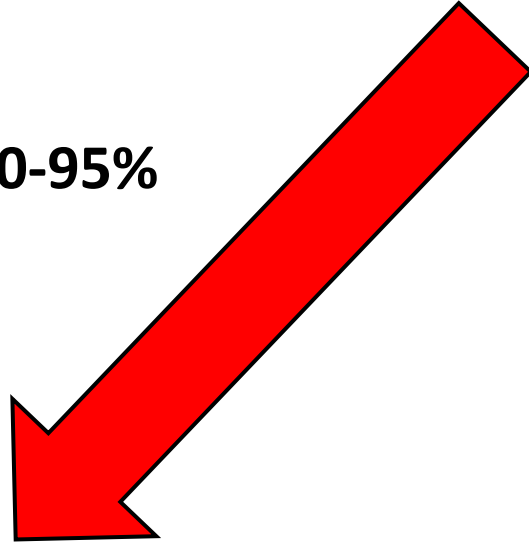
Joan Soriano (Hospital Universitario de la Princesa, Madrid, Spain) told The Lancet Oncology, "Within the European Union, we need to protect the health of non-smokers and particularly children and the young."

che **assorbite** fumando circa **40** sigarette tradizionali.



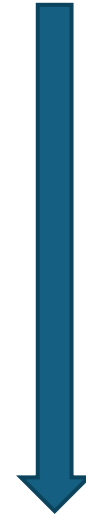
# Gli e-liquids

80-95%



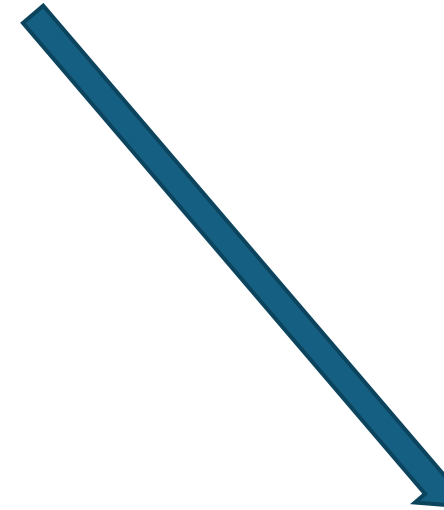
## Solventi

(glicole propilenico e glicerina vegetale)



## Aromi

Più di **15.500**  
diversi aromi in  
commercio



## Nicotina

Quando presente, le sue  
concentrazioni possono  
arrivare a **50 mg/mL**

# Sostanze rilevate negli e-liquids e nello svapo

## *Substances identified*

- Nicotine
- Humectants/solvents (e.g. propylene glycol and glycerol)
- Flavorings
- Carbonyl compounds (including aldehydes)
- Tobacco alkaloids
- Tobacco-specific nitrosamines (TSNAs)
- Free radicals and reactive oxygen species (ROS)
- Volatile organic compounds (VOCs) and phenolic compounds
- Residual solvents
- Polycyclic aromatic hydrocarbons (PAHs)
- Phthalates
- Metals
- Caffeine
- Pharmaceutical compounds
- +Microorganisms
- Substances present in combustible cigarettes but typically not identified in e-cigarette aerosols*
- Carbon monoxide
- Tar

## *Carcinogens*

### *Class 1 Potent carcinogens*

- Formaldehyde ←
- Benzene4-(methylnitroso-amino)-1-(3-pyridyl)-1-
- Butanone
- Cadmium

### *Class 2a Probable carcinogens*

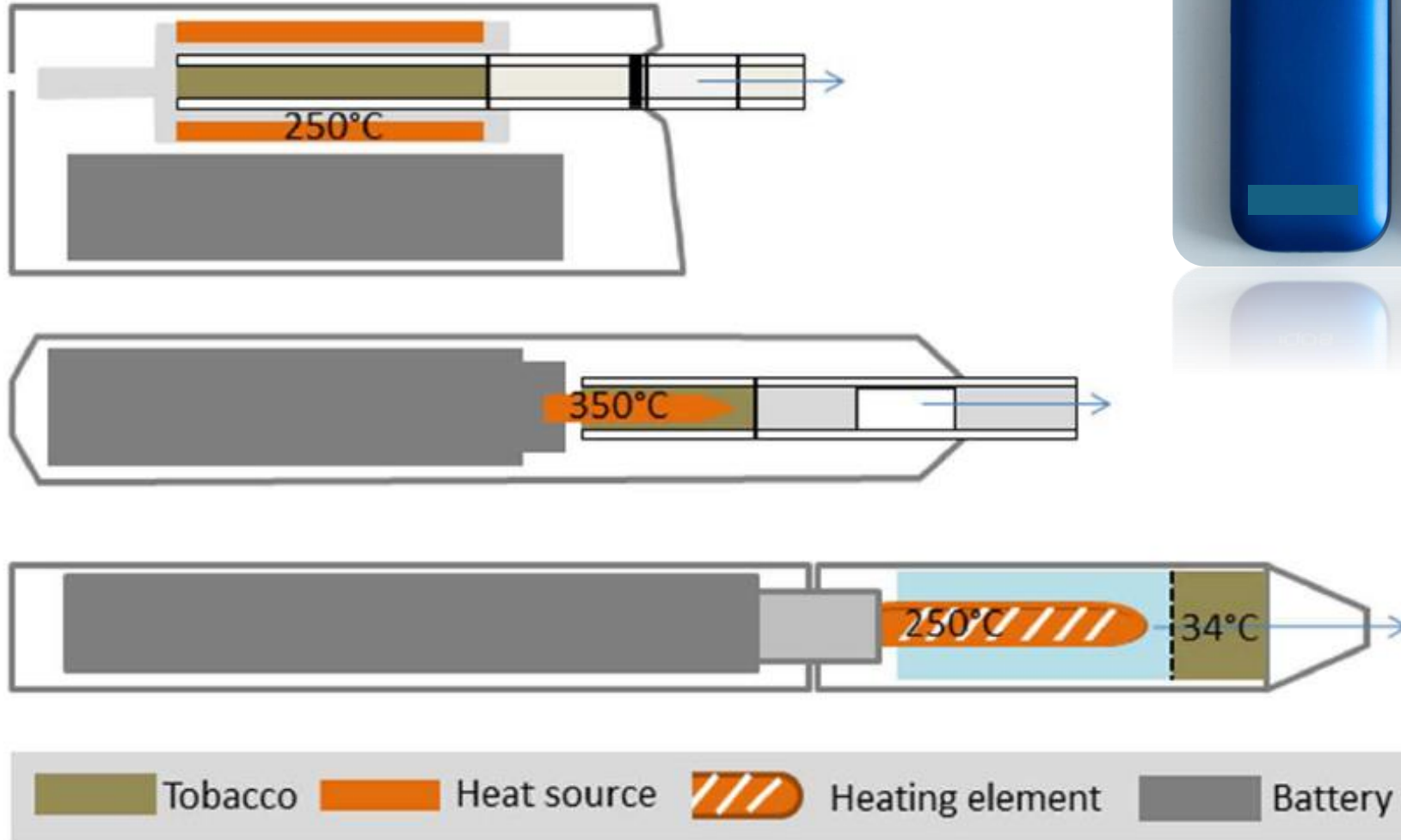
- Acetaldehyde ←
- 1,2-Propanediol
- Isoprene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Indenol(1,2,3-cd) pyrene
- Chromium
- Lead

### *Class 2b Possible carcinogens*

- Acrolein ←
- Toluene M,p-xylene
- Phenol
- Benzo(e)pyrene
- Benzo(g,h,i) perylene
- Chrysene
- Nickel (more in e cig.)

Gli studi vengono eseguiti su **precise quantità di svapo** prodotti in procedure standardizzati, ma nella vita reale l'esposizione dipende anche dalle **modalità di utilizzo** (voltage, calore del liquido) e dalle **abitudini del fumatore.**

# Prodotti a tabacco riscaldato



Mallock N, et al. *Heated Tobacco Products: A Review of Current Knowledge and Initial Assessments*. *Front Public Health*. 2019; 7: 287



**Heat-Not-Burn Tobacco Cigarettes:  
Smoke by Any Other Name**

The IQOS  
smoke had **84%**  
of the nicotine  
found in  
conventional  
cigarette  
smoke.

Analyzed Compound	HNB Cigarette		Conventional Cigarette		Proportion of the Chemical in HNB and Conventional Cigarettes, %
	Amount, Mean (SD)	No. of Replications for Each Assay	Amount, Mean (SD)	No. of Replications for Each Assay	
<b>Volatile organic compounds, µg per cigarette<sup>a</sup></b>					
Acetaldehyde	133 (35)	5	610 <sup>b</sup>	1	22
Acetone	12.0 (12.9)	5	95.5 (13.5)	2	13
Acroleine	0.9 (0.6)	2	1.1	1	<b>82</b>
Benzaldehyde	1.2 (1.4)	5	2.4 (2.6)	2	50
Crotonaldehyde	0.7 (0.9)	5	17.4	1	4
Formaldehyde	3.2 (2.7)	5	4.3 (0.4)	2	<b>74</b>
Isovaleraldehyde	3.5 (3.1)	5	8.5 (10.8)	2	41
Propionaldehyde	7.8 (4.3)	5	29.6 (36.6)	2	26
<b>Polycyclic aromatic hydrocarbons, ng per cigarette<sup>c</sup></b>					
Naphthalene	1.6 (0.5)	4	1105 (269)	7	0.1
Acenaphthylene	1.9 (0.6)	4	235 (39)	7	0.8
Acenaphthene	145 (54)	4	49 (9)	7	295
Fluorene	1.5 (0.6)	4	371 (56)	7	0.4
Anthracene	0.3 (0.1)	4	130 (18)	7	0.2
Phenanthrene	2.0 (0.2)	4	292 (44)	7	0.7
Fluoranthene	7.3 (1.1)	4	123 (18)	7	6
Pyrene	6.4 (1.1)	4	89 (15)	7	7
Benz[a]anthracene	1.8 (0.4)	4	33 (4.2)	7	6
Chrysene	1.5 (0.3)	4	48 (6.2)	7	3
Benzo[b]fluoranthene	0.5 (0.2)	4	24 (2.9)	7	2
Benzo[k]fluoranthene	0.4 (0.2)	4	4.3 (2.8)	7	9
Benzo[a]pyrene	0.8 (0.1)	4	20 (2.9)	7	4





Generally recognized as safe (GRAS)

L’FDA ha inserito PG, VG e molti aromi per e-cig nella lista GRAS in quanto utilizzati ampiamente nell’industria alimentare e cosmetica.

**Ma i loro effetti se inalati ripetutamente non sono noti...**

# I solventi sono irritanti per le vie aeree

**Tosse secca** nei lavoratori di teatro e cinema esposti al fumo di scena prodotto riscaldando PG e VG; nel lungo periodo l'esposizione sembra causare **sensazione di costrizione toracica, wheezing, riduzione della funzione respiratoria**

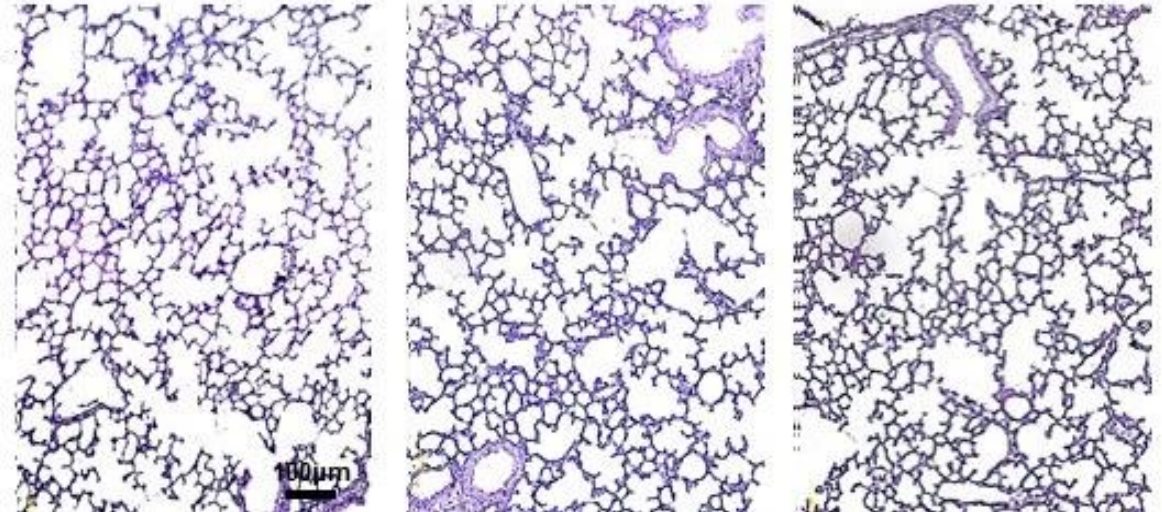
The main e-cigarette component vegetable glycerin enhances neutrophil migration and fibrosis in endotoxin-induced lung injury via p38 MAPK activation



PBS

VG 30%

VG 60%



*Su VY, et al. Respir Res. 2023 Jan 10; 24(1): 9*

# Anche alcuni aromi possono essere nocivi

## CLINICAL BRONCHIOLITIS OBLITERANS IN WORKERS AT A MICROWAVE-POPCORN PLANT



L'inalazione del **diacetile (2,3-butanedione)**, uno dei composti chimici più rappresentati negli aromi per e-cig, in particolare in quelli che forniscono un aroma di **burro / dolciumi**, causa bronchiolite obliterante nei lavoratori delle ditte di pop-corn per microonde.

“Pop-corn worker’s lung”

*Gwinn WM et al. Inhal Toxicol. 2017; 29: 310-21*

*Kreiss K et al. N Engl J Med 2002; 347: 330-8*

*van Rooy FG et al. Am J Respir Crit Care Med 2007; 176: 498-504*

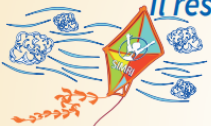
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Torino, 10-12 ottobre 2024

- Dimensioni del problema
- Cosa sono le e-cig?
- **Gli effetti sulla salute**
- Come proteggere i ragazzi?

August 2019 - First reports to the CDC

# EVALI

E-cigarette or Vaping use-  
Associated Lung Injury

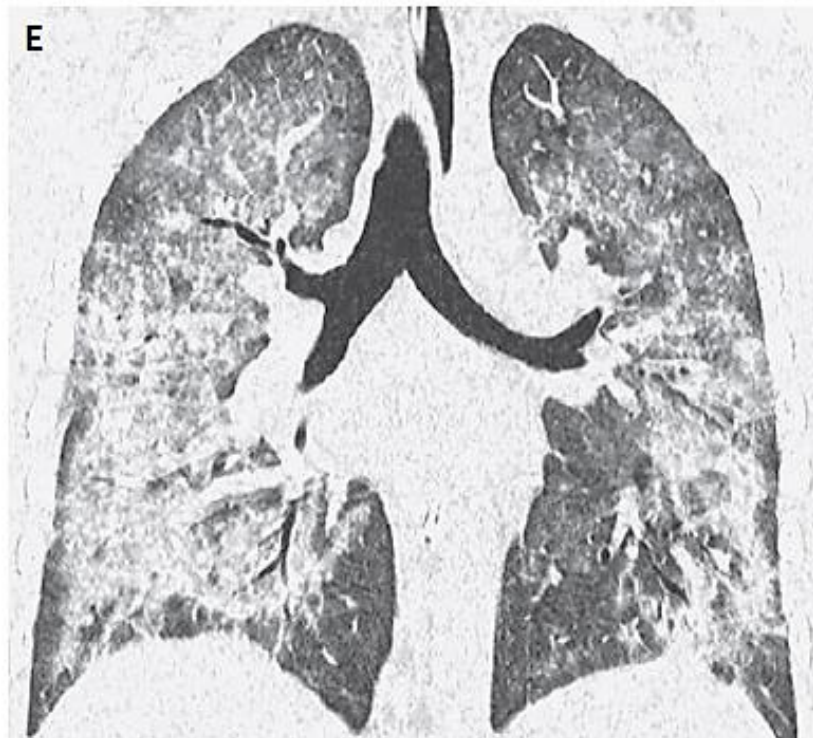
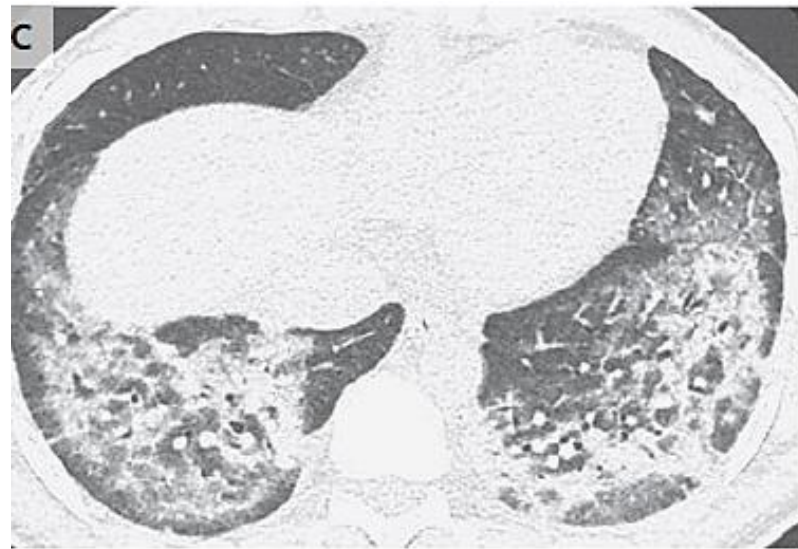
# The EVALI epidemics

## Symptoms reported at presentation

Median duration of symptoms before presentation (range) — days	6 (0–155)
Any respiratory symptom — no./total no. (%)§	95/98 (97)
Shortness of breath	83/98 (85)
Any chest pain	51/98 (52)
Pleuritic chest pain	35/98 (36)
Cough	83/98 (85)
Hemoptysis	8/98 (8)
Any gastrointestinal symptom — no./total no. (%)§	75/98 (77)
Nausea	65/98 (66)
Vomiting	60/98 (61)
Diarrhea	43/98 (44)
Abdominal pain	33/98 (34)
Any constitutional symptom — no./total no. (%)§	98/98 (100)
Subjective fever	82/98 (84)
Chills	59/98 (60)
Weight loss	25/98 (26)
Fatigue or malaise	46/98 (47)
Headache — no./total no. (%)	33/98 (34)
<b>Vital signs at presentation</b>	
Temperature $\geq 38^{\circ}\text{C}$ — no./total no. (%)	30/92 (33)
Heart rate $> 100$ beats/min — no./total no. (%)	60/95 (63)
Respiratory rate $> 20$ breaths/min — no./total no. (%)	40/92 (43)
Oxygen saturation while breathing ambient air — no./total no. (%)	
$\geq 95\%$	39/93 (42)
89–94%	31/93 (33)
$\leq 88\%$	23/93 (25)

- 98 pazienti tra confermati e probabili
- Età mediana 21 anni (range 15-53)

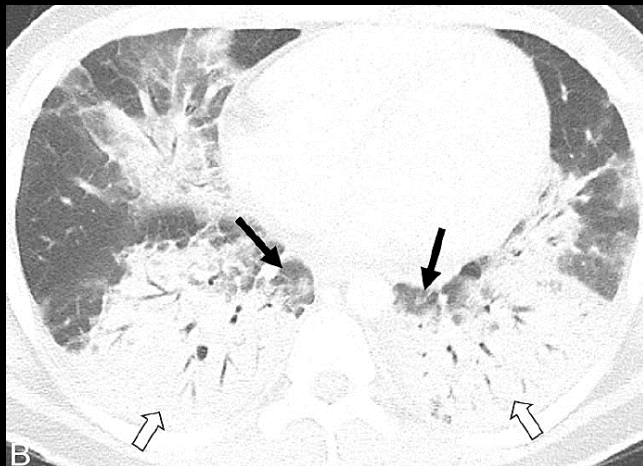
*Layden JE et al. Pulmonary Illness  
Related to E-Cigarette Use in Illinois  
and Wisconsin - Final Report.  
N Engl J Med. 2020; 382: 903-16*



Rischio di  
evoluzione in  
ARDS; circa 1/3 dei  
pazienti necessita  
di ventilazione  
meccanica

#### Clinical course

Hospitalization — no./total no. (%)	93/98 (95)
Outpatient or ED visit before hospitalization — no./total no. (%)	61/93 (66)
Median duration of hospitalization (range) — days	6 (1–72)
Receipt of supplemental oxygen — no./total no. (%)	74/98 (76)
Receipt of noninvasive positive-pressure ventilation — no./total no. (%)	22/98 (22)
Intubation and mechanical ventilation — no./total no. (%)	25/98 (26)
Admission to intensive care unit — no./total no. (%)	52/98 (53)
Death — no./total no. (%)	2/98 (2)



**15 years, M - Diffuse alveolar damage**



**16 years, M - Hypersensitivity pneumonitis-like pattern**



**14 years, F - Acute eosinophilic pneumonia-like pattern**

La **tossicità acuta** delle e-cig è maggiore rispetto a quelle tradizionali, per la quali non esiste **nulla** che somigli all' EVALI

CT imaging findings of EVALI reflect **varying degrees and stages of acute lung injury**, being pattern of organizing pneumonia the more typical.



**16 years, F - Organizing pneumonia**

# The E-cigarette or Vaping Product Use–Associated Lung Injury Epidemic: Pathogenesis, Management, and Future Directions

## An Official American Thoracic Society Workshop Report

### Confirmed Case

E-cigarette use in 90 d before symptom onset

AND

Pulmonary infiltrate, such as opacities, on plain film chest radiograph or ground-glass opacities on chest CT

AND

Absence of pulmonary infection on initial work-up. *Minimum criteria* are:

1. A negative respiratory viral panel<sup>†</sup>
2. A negative influenza PCR or rapid test, if local epidemiology supports influenza testing
3. All other clinically indicated respiratory infectious disease testing (e.g., urine antigen for *Streptococcus pneumoniae* and *Legionella*, sputum culture if productive cough, BAL culture if done, blood culture, HIV-related opportunistic respiratory infections if appropriate) are negative

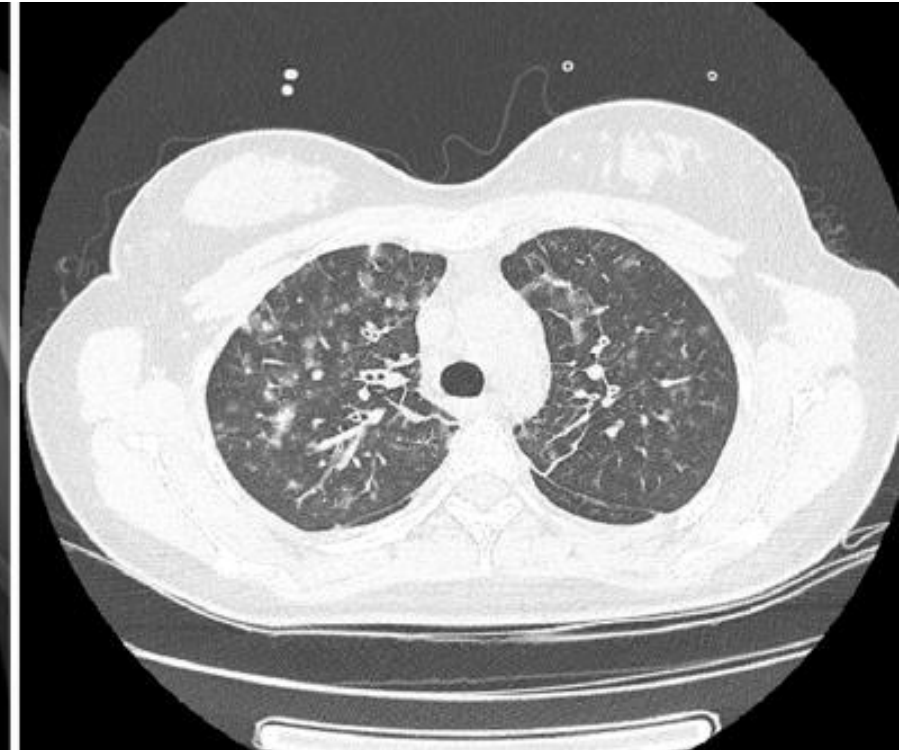
AND

No evidence in medical record of alternative plausible diagnoses (e.g., cardiac, rheumatologic, or neoplastic process)

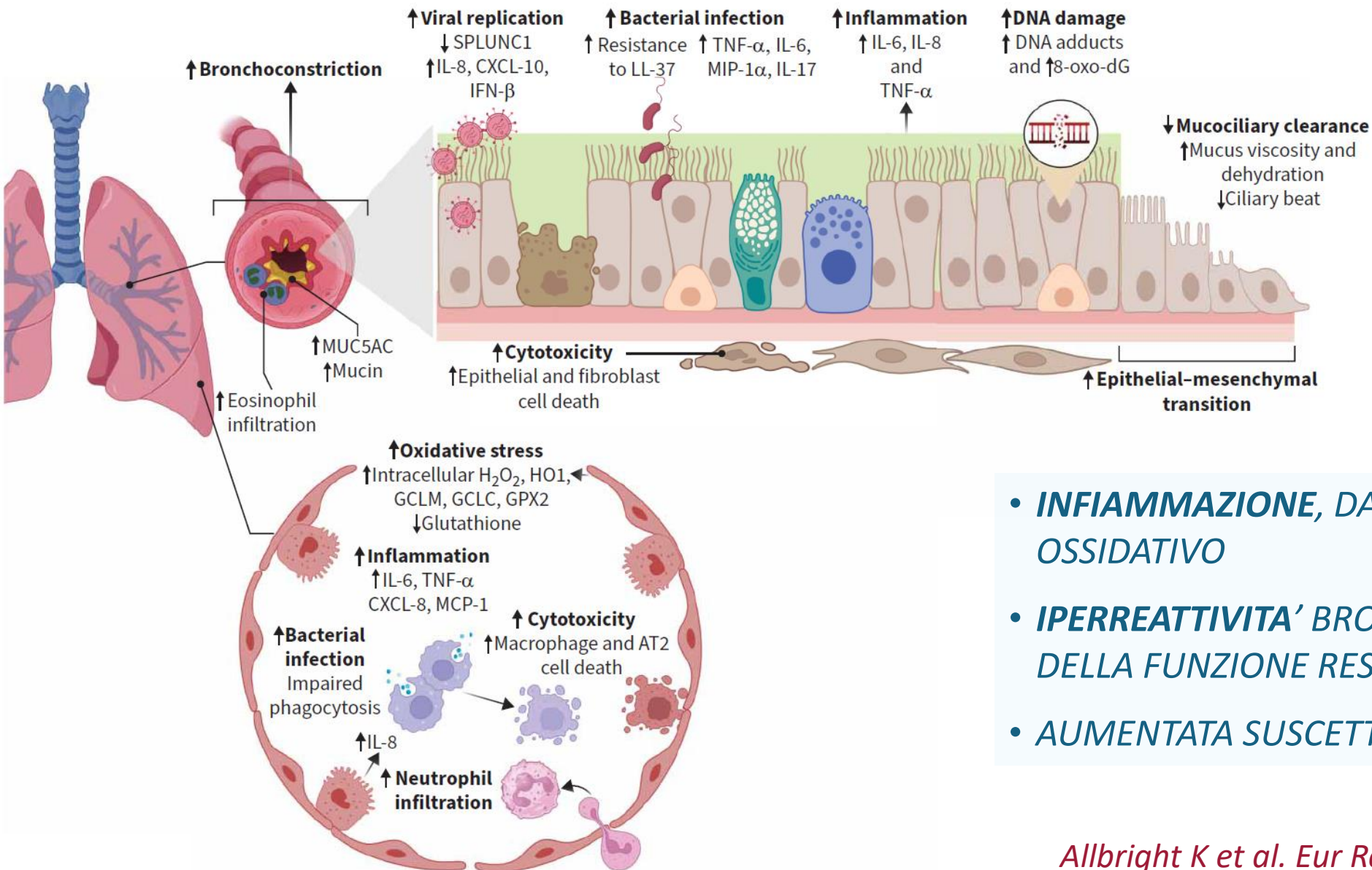
# Acute Eosinophilic Pneumonia after Combined Use of Conventional and Heat-Not-Burn Cigarettes: A Case Report



- A 22-year-old woman with dyspnea, cough, and fever
- **2 weeks before** the onset of symptoms, she started smoking **HNBCs**. She initially started with **6 cigarettes per day** but increased to **15 cigarettes per day** just before the onset of symptoms.
- *BAL: 62% eosinophils, 15% lymphocytes, 14% macrophages, and 4% neutrophils*

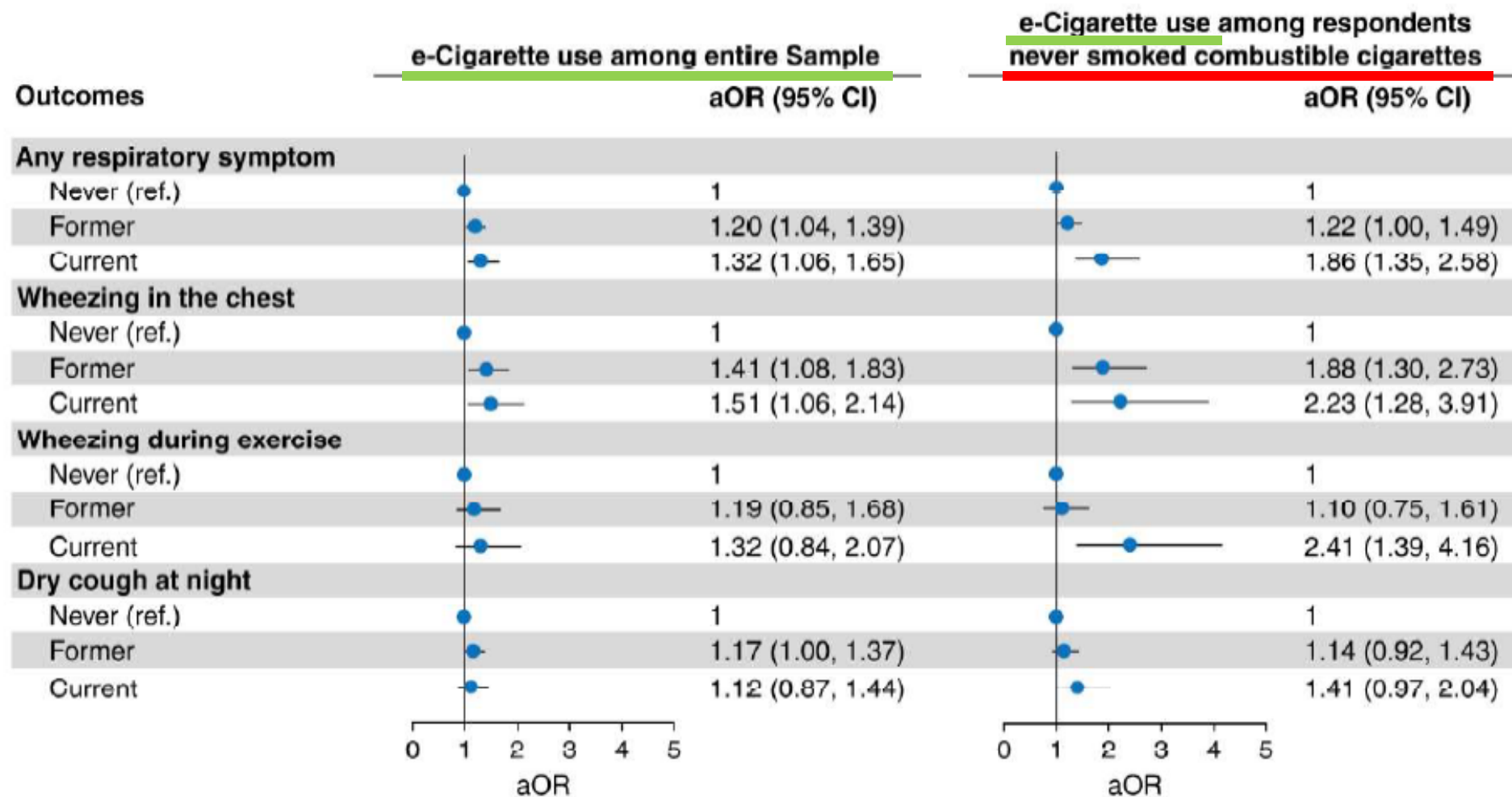


# Effetti segnalati sull'apparato respiratorio



- **INFIAMMAZIONE, DANNO TISSUTALE, STRESS OSSIDATIVO**
- **IPERREATTIVITA' BRONCHIALE E ALTERAZIONE DELLA FUNZIONE RESPIRATORIA**
- **AUMENTATA SUSCETTIBILITA' ALLE INFEZIONI**

# Association of Electronic Cigarette Use with Respiratory Symptom Development among U.S. Young Adults



Analyzing PATH (Population Assessment of Tobacco and Health) data, we found that the **use of e-cigarettes among healthy young adults was associated with the development of respiratory symptoms, including those who used ecig exclusively**

# Potential effects of E-cigarettes and vaping on pediatric asthma

*Di Cicco M et al. Minerva Pediatr. 2020; 72: 372-82*

- Studi sull'**adulto** hanno dimostrato che lo svapo provoca broncostruzione.
- Negli **adolescenti**, studi cross-sectional hanno dimostrato una associazione tra l'utilizzo delle e-cig e sintomi da bronchite cronica / asma (self-reported).
- I ragazzi asmatici fumano **tanto quanto i coetanei**, se non di più! E fumano **di più** le e-cig.

*Lee A et al. Sci Rep. 2019; 9: 17699*

*Fedele DA. Ann Epidemiol. 2016; 26: 865-9*

*Turner E et al. Ann Allergy Asthma Immunol. 2018; 120: 220-2*



# How E-cigarettes and vaping can affect asthma in children and adolescents

Vapers have a **2-fold higher risk** of chronic cough, phlegm, dyspnea, and greater incidence of asthma

First author	Year of publication	Country	Number of subjects	Age	ENDS use	Outcome	Results	Adjusted odds ratios
Wills ref. [48]	2020	United States	14.765	Range: 14–18 years	Current EC users (in the previous 30 days), ever users	Self-reported doctor diagnosis of asthma	A significant association with <b>asthma</b> was found for current and ever use of EC	aOR for asthma in the previous year in current EC users: 1.30 (95% CI, 1.10–1.53) aOR for asthma in the previous year in ever EC users: 1.15 (95% CI, 1.02–1.30)
Tackett ref. [55 <sup>■</sup> ]	2020	United States	7.049	Range: 12–17 years	Never users, no use in the previous 12 months, current EC users (in the previous 30 days), use in the previous 7 days	Self-reported episodes of wheezing in the previous 12 months	A significant association with <b>wheezing</b> was found only in the unadjusted model for EC users.	aOR for wheezing in the previous year in current EC users 1.35 (95% CI, 0.63–2.88); in EC use in the previous year 1.37 (95% CI, 0.91–2.05); in EC use in the previous 7 days 0.74 (95% CI, 0.28–1.97)
Alnajem ref. [56 <sup>■</sup> ]	2020	Kuwait	1.565	Range: 16–19 years	Current EC users (in the previous 30 days), second-hand exposure to EC in the past 7 days)	Self-reported current wheeze (previous 12 months), current asthma (history of clinical diagnosis and current wheeze and/or medication use), and current symptoms of uncontrolled asthma	E-cigarette use and their household SHA exposure were independently associated with <b>asthma symptoms</b> among adolescents	aOR for current wheeze in the previous year in current EC users: 1.54 (95% CI, 1.01–2.45) aOR for current asthma in current EC users: 1.85 (95% CI, 1.03–3.41)
Chung ref. [57 <sup>■</sup> ]	2020	Korea	60.040	Mean: 15.2±0.02 years	Current users (in the previous 30 days), former (not within the previous 30 days) or never user of CC, EC and HTP	Self-reported doctor diagnosis of asthma and/or allergic rhinitis in the previous 12 months	Current sole EC use was associate with current AR but not with asthma; higher risk of <b>asthma and AR</b> compared with current CC only users in those using CC + EC and/or HTP.	aOR for asthma in the previous year in current EC only users: 1.00 (95% CI, 0.4–2.2)
Cherian ref. [58 <sup>■</sup> ]	2021	United States	9.750	Range: 12–17 years	Use of ENDS in the previous 12 months	Self-reported wheezing in the previous 12 months; doctor or nurse diagnosis of asthma in the previous 12 months	No association between asthma diagnosis and ENDS use. ENDS use was associated with <b>wheezing and dry cough</b> in the previous year.	aOR for wheezing in general in ENDS users 1.37 (95% CI, 1.11–1.71); wheezing 4–12 times per year 1.57 (95% CI, 1.01–2.46); wheezing > 12 times per year 2.58 (95% CI, 1.04–6.41) aOR for dry cough at night in ENDS users: 1.23 (95% CI, 1.01–1.51)

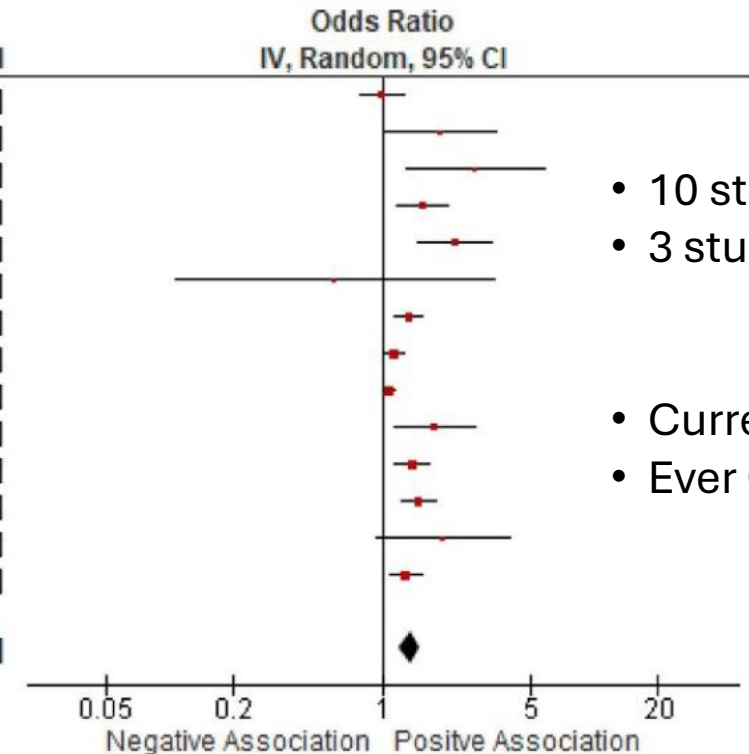
No data is currently available on the respiratory effects of vaping in **children** (age < 12 years).



# Association between e-cigarette use and asthma: a systematic review and meta-analysis

**Current  
e-cig use**

Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Random, 95% CI
Alanazi et al. 2020 (27)	0.001	0.1247	8.4%	1.00 [0.78, 1.28]
Alnajem et al. 2020 (38)	0.6281	0.3054	2.9%	1.87 [1.03, 3.41]
Cho & Paik 2016 (28)	1.0084	0.3806	2.0%	2.74 [1.30, 5.78]
Choi 2016 Metro (34)	0.4383	0.1435	7.5%	1.55 [1.17, 2.05]
Choi 2016 Non-metro (34)	0.7885	0.2084	5.0%	2.20 [1.46, 3.31]
Chung et al. 2020 (29)	-0.5108	0.885	0.4%	0.60 [0.11, 3.40]
Fedele et al. 2016 (35)	0.2927	0.078	11.0%	1.34 [1.15, 1.56]
Kim et al. 2017 (13)	0.1205	0.0564	12.2%	1.13 [1.01, 1.26]
Kim et al. 2020 (30)	0.0749	0.0331	13.2%	1.08 [1.01, 1.15]
Larsen et al. 2016 (36)	0.5766	0.2229	4.6%	1.78 [1.15, 2.76]
Osei et al. 2019 (26)	0.3293	0.0967	10.0%	1.39 [1.15, 1.68]
Schweitzer 2017 (37)	0.392	0.0942	10.1%	1.48 [1.23, 1.78]
Wang et al. 2019 (31)	0.6627	0.3643	2.2%	1.94 [0.95, 3.96]
Wills et al. 2020 (32)	0.2624	0.0852	10.6%	1.30 [1.10, 1.54]
<b>Total (95% CI)</b>			<b>100.0%</b>	<b>1.36 [1.21, 1.52]</b>
Heterogeneity: Tau <sup>2</sup> = 0.02; Chi <sup>2</sup> = 47.88, df = 13 (P < 0.00001); I <sup>2</sup> = 73%				
Test for overall effect: Z = 5.25 (P < 0.00001)				

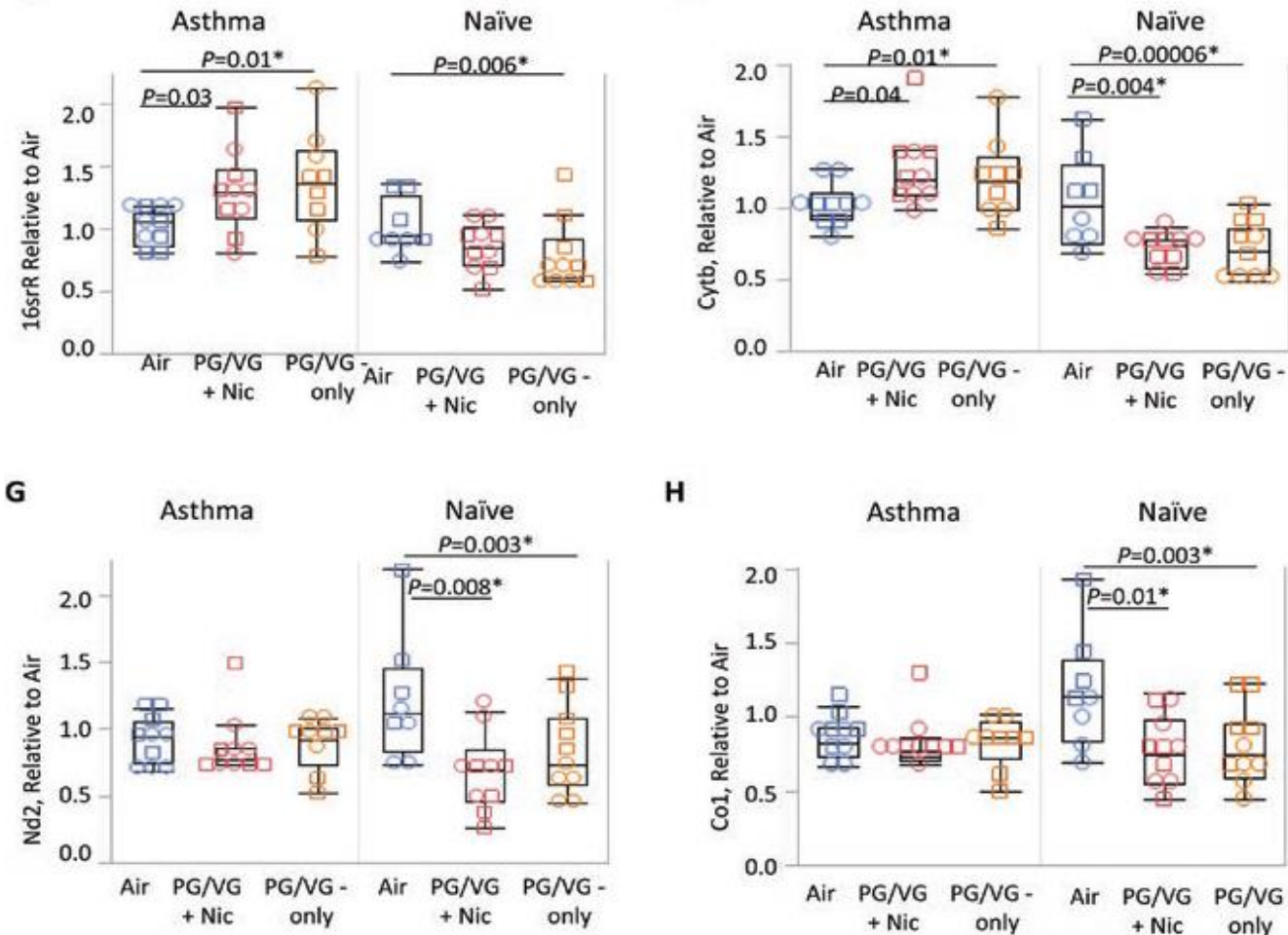


- 10 studi adolescenti
- 3 studi adulti
- Current OR 1.36
- Ever OR 1.24

Current e-cigarette use = past 30 days; Asthma = self-reported current asthma diagnosis.

**Self reported current  
asthma diagnosis**

# Long-Term Impact of Daily E-cigarette Exposure on the Lungs of Asthmatic Mice



4 hours daily for 3 months

- In **naïve** mice exposed to PG/VG+Nicotine and PG/VG-only, **higher INF- $\gamma$**  was observed compared to mice exposed only to air.
- In **asthmatic mice**, PG/VG+Nicotine increased **PAS-positive cells** and **IL-13** compared to mice exposed to air and PG/VG-only
- Such goblet cell hyperplasia is a hallmark of **airway remodeling** and is associated with **asthma severity**

# Altri rischi per la salute?



**Secondhand nicotine vaping at home and respiratory symptoms in young adults**

*Islam T et al. Thorax 2022; 77: 664-9*



**Association between exposure to secondhand aerosol from heated tobacco products and respiratory symptoms among current non-smokers in Japan: a cross-sectional study**

*Yoshioka T et al. BMJ Open. 2023; 13: e065322*

*Farber HJ et al. Ann Am Thorac Soc. 2021; 18: 567-72*

*Tzortzi A et al. Environ Res. 2020;182:108963*

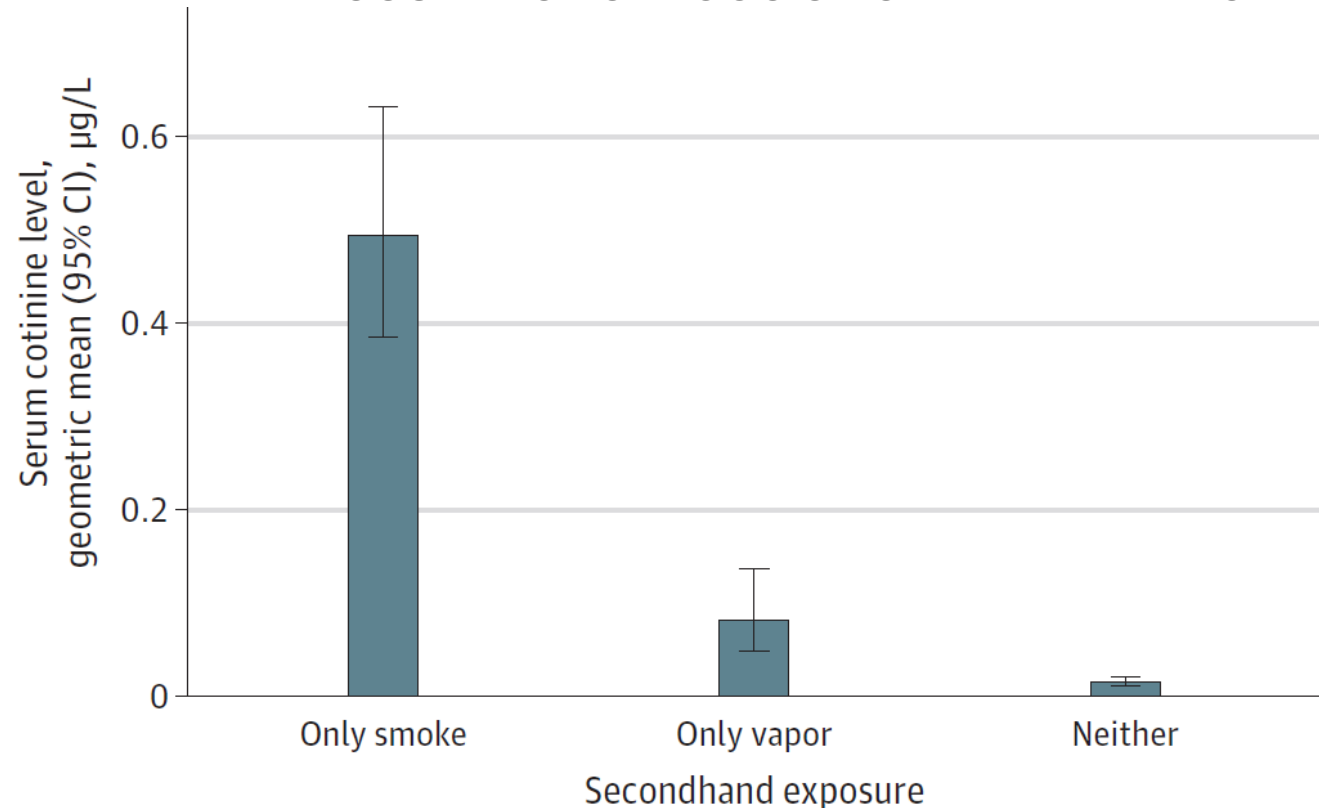
*Nanninga EK et al. Int J Environ Res Public Health. 2023; 20: 2632*



# Secondhand Nicotine Absorption From E-Cigarette Vapor vs Tobacco Smoke in Children

- *Participants were interviewed in their homes and, several days after, visit a mobile examination center to provide **biological specimens**.*
- **1777 children aged 3 to 11 years** (mean age 7.4 (2.6) years) with serum cotinine levels incompatible with current firsthand nicotine use (ie,  $<15 \mu\text{g/L}$ ).

**NICOTINE ABSORPTION BY REPORTED SECOND HAND EXPOSURE TO TOBACCO SMOKE AND VAPING**



# Association between Second-Hand Exposure to E-Cigarettes at Home and Exacerbations in Children with Asthma

	Group A (Exposed)	Group B (Unexposed)
Age, mean $\pm$ SD, years	9.7 $\pm$ 3.6	11.8 $\pm$ 4.1
Gender, <i>n</i> (%)	Male, 16 (59.3) Female, 11 (40.7)	Male, 16 (59.3) Female, 11 (40.7)

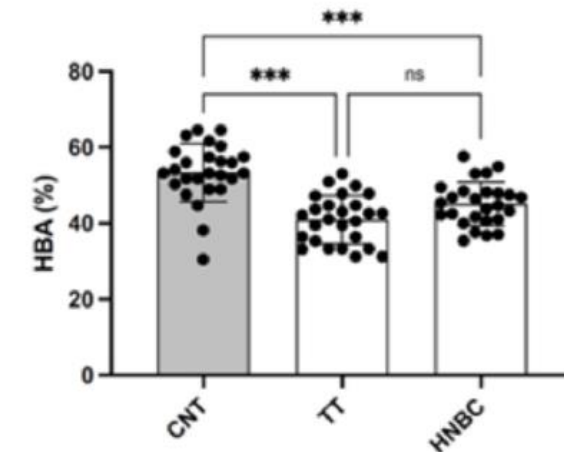
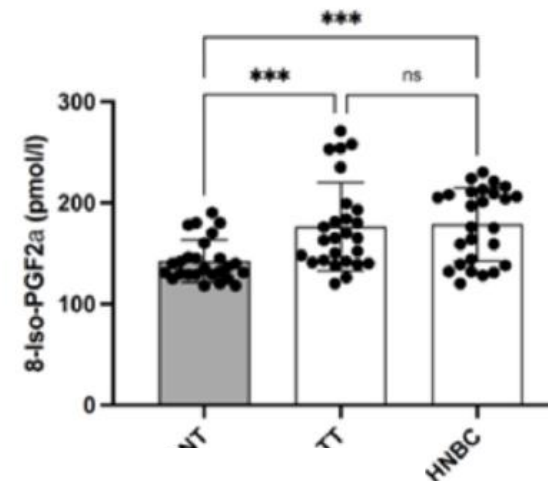
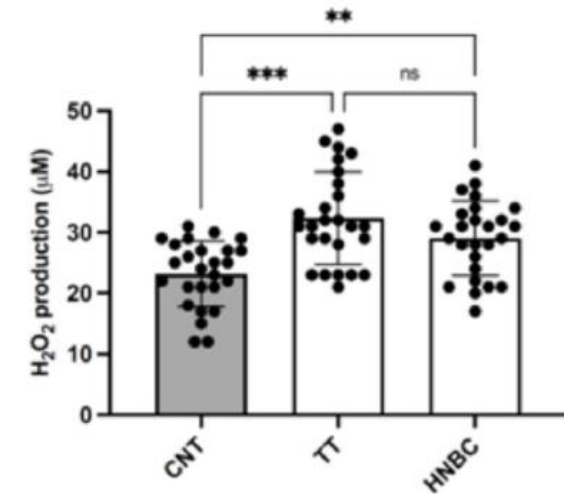
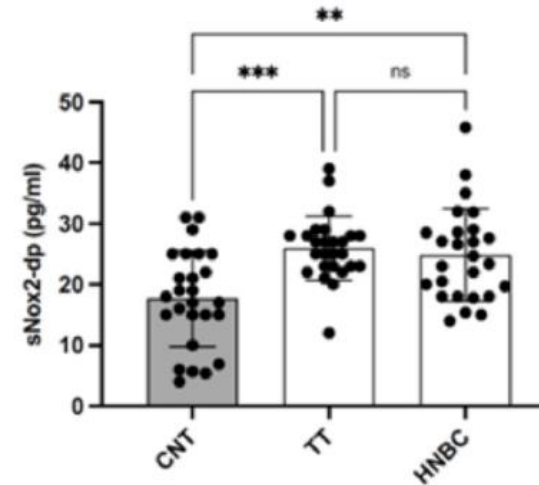
54 bambini asmatici

Second-Hand Exposure to E-Cigarettes	Group A (Yes)	Group B (No)	<i>p</i>
Exacerbations, mean $\pm$ SD, <i>n</i> /year	7.7 $\pm$ 6.8	5.7 $\pm$ 6.1	0.27
Need for rescue therapy, <i>n</i> (%)	6	1	0.19
Need for therapeutic step-up, <i>n</i> (%)	44.4	29.6	0.3
ACT/c-ACT score, mean $\pm$ SD	17.2 $\pm$ 7.6 18.3 $\pm$ 5.6	19.6 $\pm$ 3.8 14.6 $\pm$ 5.8	0.3 0.4

(ACT: Asthma Control Test; c-ACT: children-Asthma Control Test; *n*: number; SD: standard deviations).

# Impact of heat-not-burn cigarette passive smoking on children's oxidative stress, endothelial and platelet function☆

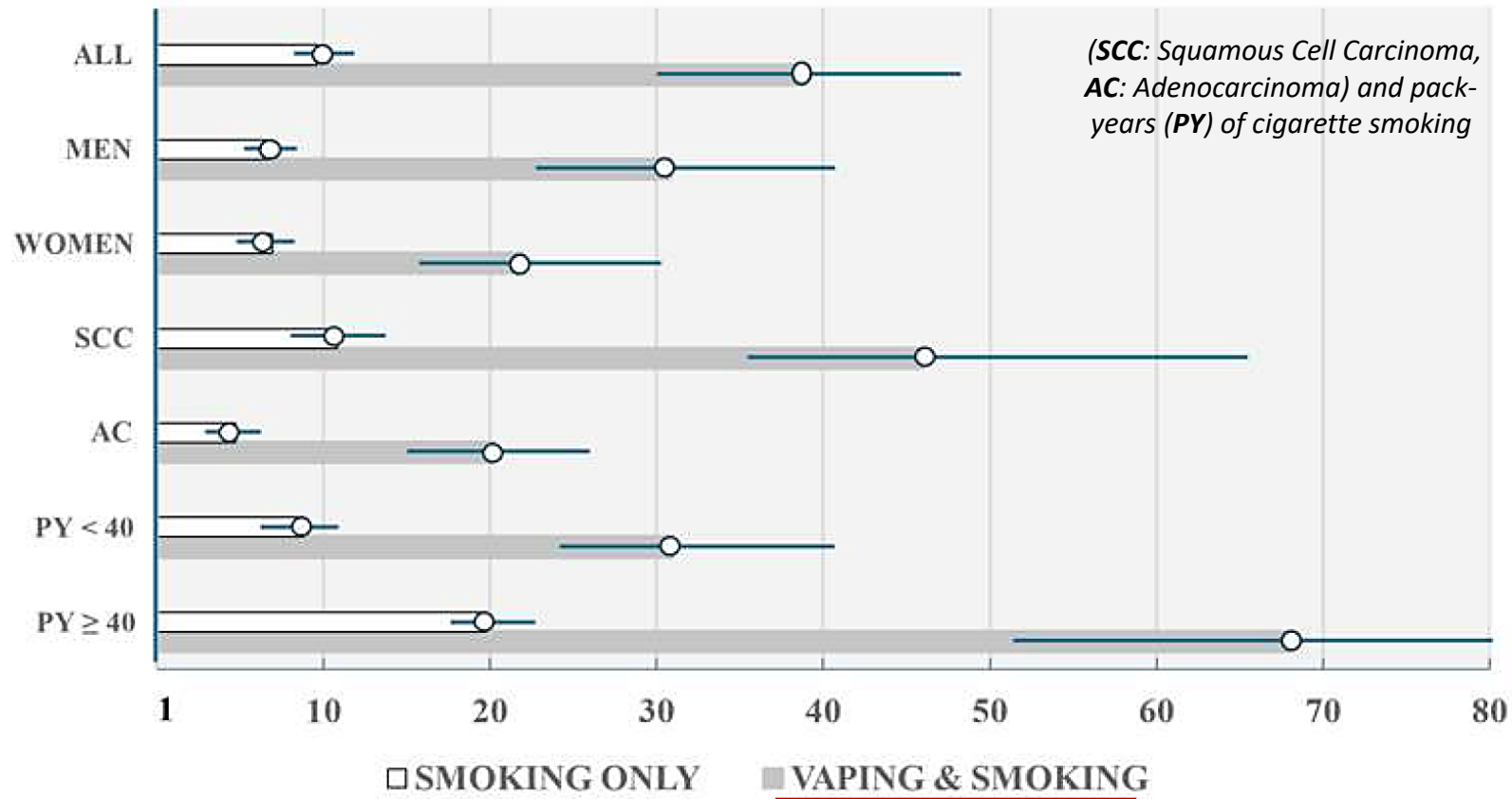
- **78 children** (2-18 yrs): **HNBC passive** smokers (n = 26) / **TT cigarette** exposed (n = 26) / **Control** (CNT) group (n = 26, unexposed).
- *Passive smoking-exposed children (both HNBC and TT) exhibited significantly **increased** serum sNOX2-dp, isoprostanes, H<sub>2</sub>O<sub>2</sub>, sCD40L sP-selectin and thrombus formation versus controls. Conversely, exposed children displayed **reduced** brachial FMD and serum NO bioavailability. **No significant differences were found between children exposed to passive smoking of HNBC vs TT.***



Children exposed to passive HNBC smoke have **high oxidative stress, endothelial dysfunction** and **platelet activation** which could increase the cardiovascular risk. No significant difference for the above cited parameters between children exposed to HNBC and cigarette smoke to traditional tobacco

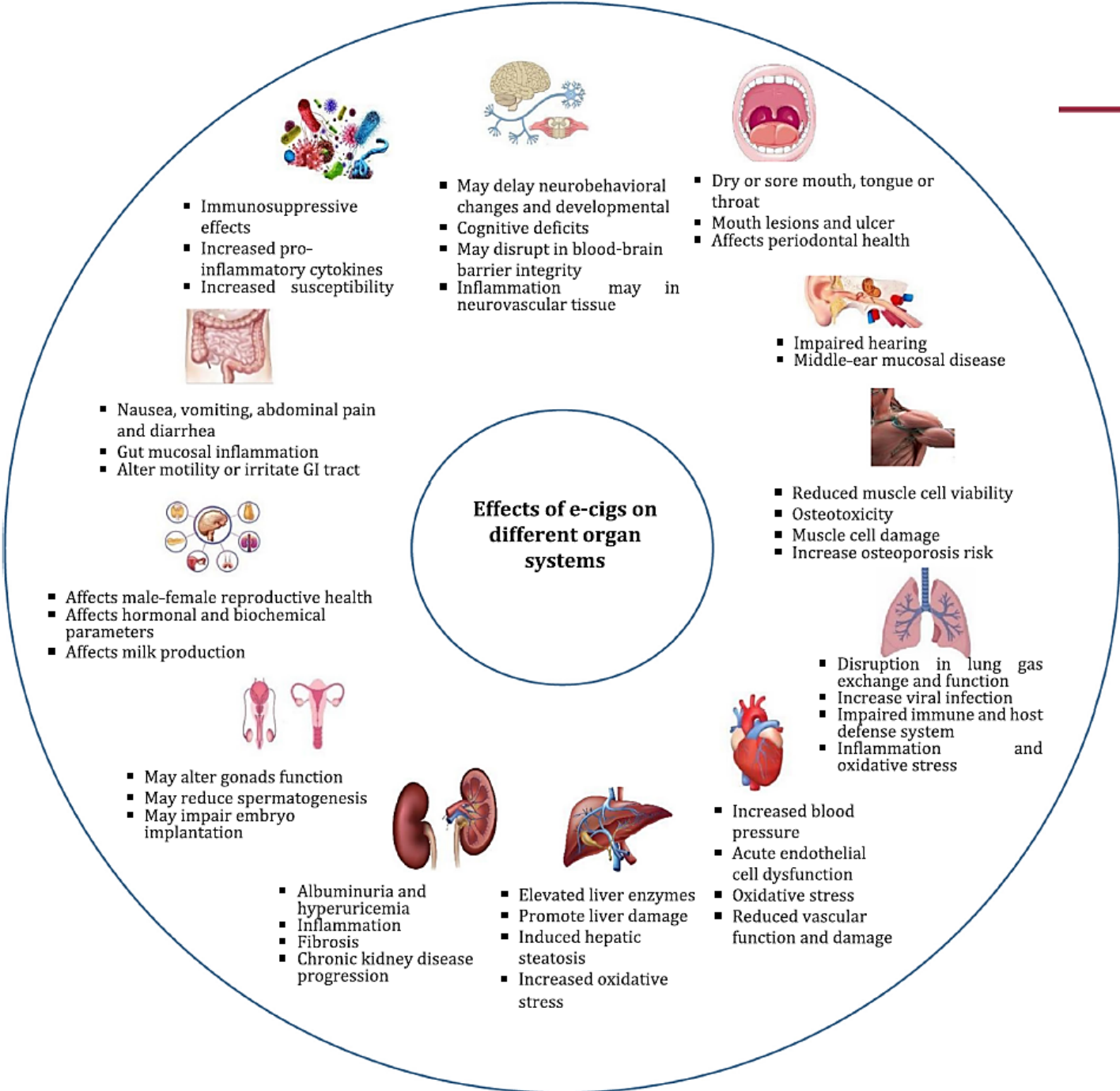
# Vaping, Smoking and Lung Cancer Risk

ODDS RATIOS FOR VAPING & SMOKING AND SMOKING ONLY



In a case control study of **4975** lung cancer cases and **27294** controls without cancer, we found that the risk of lung cancer among those who combined vaping with cigarette smoking (OR=38.7) was **4-fold higher** than for those who only smoked (OR=9.6)

# Non solo vie aeree...



*Ali N et al. The impact of e-cigarette exposure on different organ systems: A review of recent evidence and future perspectives. J Hazard Mater. 2023; 457: 131828*

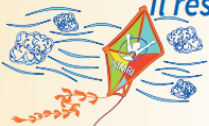
# E-cigarette: un pericolo sin dall'adolescenza



## XXVIII CONGRESSO NAZIONALE SIMRI

*Il respiro: scienza e terapia per la salute del bambino*

*Programma*



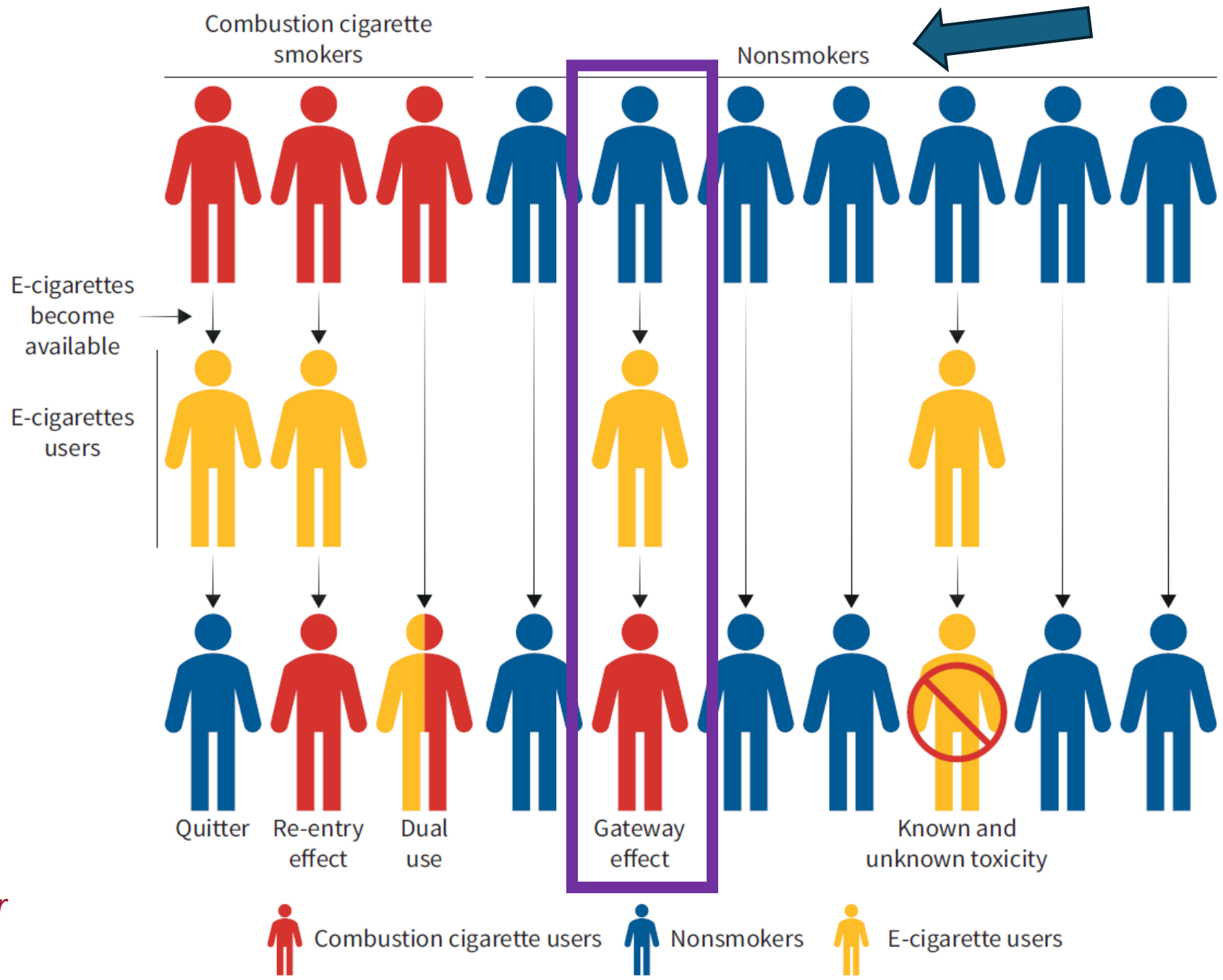
Torino, 10-12 ottobre 2024

- Dimensioni del problema
- Cosa sono le e-cig?
- Gli effetti sulla salute
- **Come proteggere i ragazzi?**

# Le ragioni del successo

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Allbright K et al. *Eur Respir J.* 2024; 63: 2301494

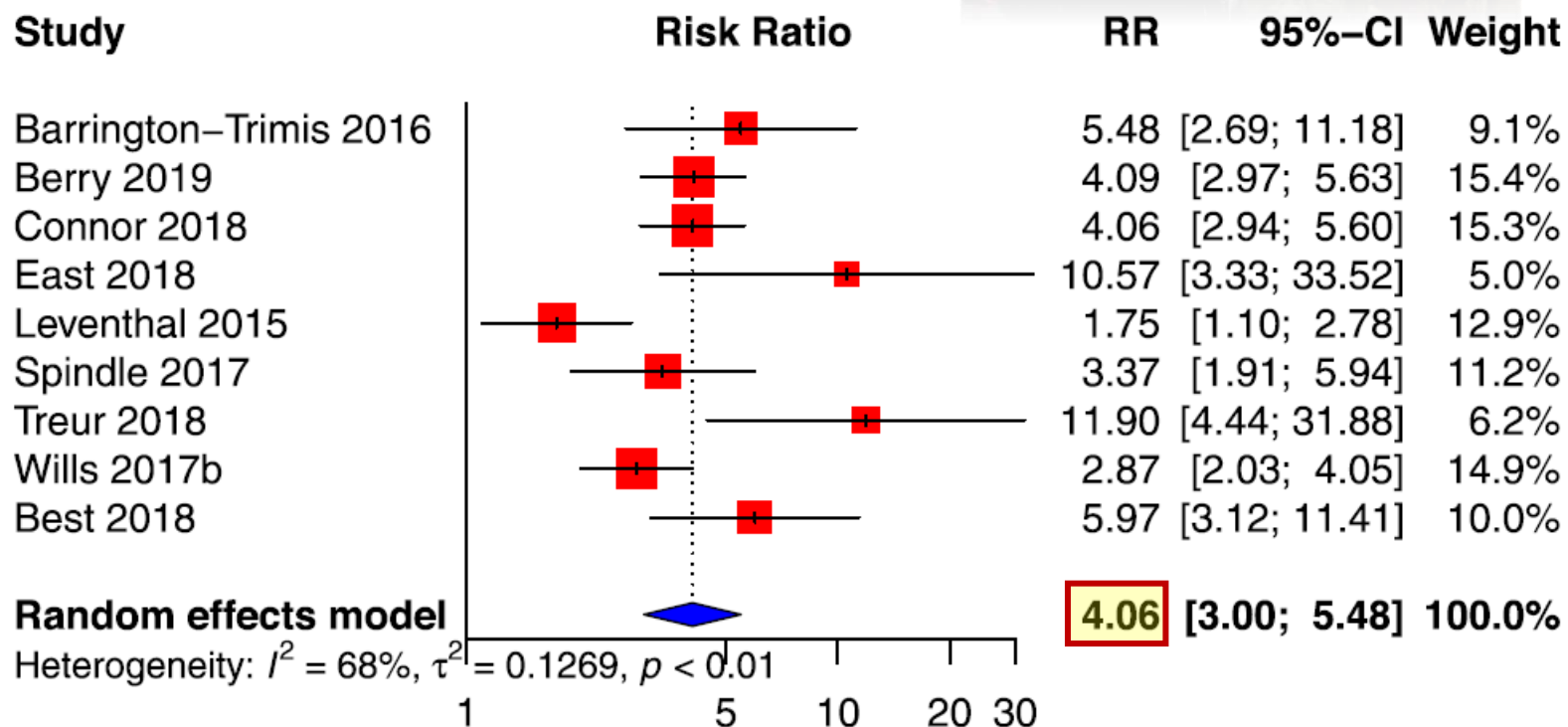


# Association between electronic cigarette use and tobacco cigarette smoking initiation in adolescents: a systematic review and meta-analysis

9 longitudinal cohort studies including adolescents (13-19 yrs) who **NEVER smoked tobacco cigarettes**, with follow-up periods between 4 and 24 months (meta-analysis of the association between **EVER use of e-cigarettes** and subsequent initiation of tobacco cigarette use).



## Il ruolo di gateway



# Il tabagismo è una malattia pediatrica

Circa la metà dei fumatori ha **iniziato** a fumare prima del 18° compleanno.



# NEW PRODUCTS



**SAME  
OLD  
TACTICS**

**#TOBACCOEXPOSED**



James Dean

*“There is a strong sense of **déjà vu** when looking at advertisements for e-cigarettes.*

*The themes are so similar, including those focused on **freedom, rebellion, and glamour**”*

***Bush A et al. Front Pediatr. 2021 Oct 4; 9: 698613.***



*Leonardo Di Caprio e Fedez*

# I giovanissimi come target



Al **2016**: in commercio presenti più di **430** marche di e-cig e più di **15.500** diversi aromi



# I giovanissimi come target



## Examples of e-cigarette products designed to target and appeal to kids:

(more examples linked in article)



E-cigarette



Cartoon



E-cigarette



Cartoon



E-cigarette



Toy



E-cigarette



Toy



E-cigarette



School supply



E-cigarette



Toy

23 agosto 2023

*La Food and Drug Administration Americana ha richiamato alcune aziende online rispetto alla vendita di sigarette elettroniche evidentemente pensate per i **bambini!***

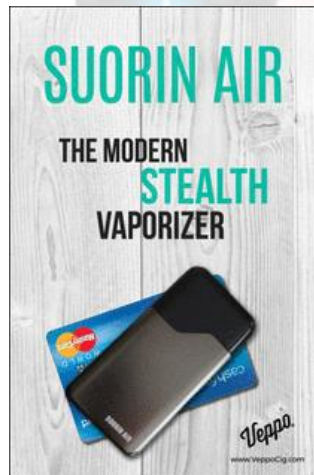
# Lo «stealth vaping»



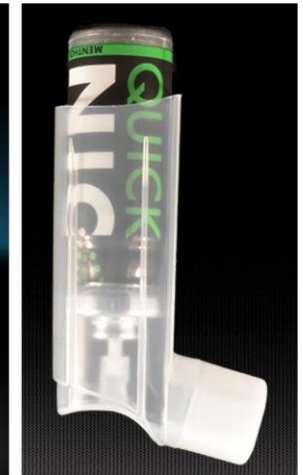
VaporCup



Micro Vaped FOB Vaporizer



PUFFIT



QuickNIC

Ramamurthi D et al. *JUUL and other stealth vaporisers: hiding the habit from parents and teachers.* *Tob Control.* 2018 Sep 15: tobaccocontrol-2018-054455

# E per i più esigenti...

Craftbox V-Play 20K disposable vape with several video games



Randm 5200 vaping device with Nintendo games



Ursa Pocket Pod Kit by Lost Vape with a casino game



The **incorporation of video games** into vaping devices raises public health concerns regarding the potential appeal to younger users and the potential to escalate nicotine use

# Il web, i social e le boutique dello svapo



**Ezee Sigaretta Elettronica**

Adesso prezzi ribassati ma devi essere maggiorenne per entrare nel sito.

Se sei maggiorenne **PROSEGUI**    Se sei minorenni **ESCI**

*Contenuti liberamente disponibili, negozi dedicati, device acquistabili anche su Amazon!*





La Spezia



Termoli



Amsterdam



Lingotto,  
giovedì  
sera...

## Il ruolo dei Pediatri

**NO!**

In famiglia fuma  
qualcuno?

...mio marito  
fuma quelle  
**FINTE...**



# L'American Academy of Pediatrics raccomanda ai pediatri di:



- *ask about e-cigarette use and provide counseling about prevention (screening and cessation) for parents and children. Encourage the use of cessation devices, both for parents and children.*
- *Identify and address environments where children and teenagers live, visit, learn, play and work that are not free of tobacco and e-cigarettes.*
- *do not recommend e-cigarettes or cessation devices.*

Anche un **breve colloquio** può aumentare i tassi di cessazione

I pediatri devono sempre considerare il potenziale ruolo dello svapo quando si trovano a gestire malattie respiratorie **inusuali**



**Attivo dal lunedì al venerdì  
dalle ore 10 alle ore 16**

www.smettodifumare.iss.it

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## ingredienti del tabacco e delle sigarette elettroniche

Cerca il prodotto

RAGGIUNGI SITO

Tabacco

Carta

Filtro

Nicotina



**Telefono Verde  
contro il Fumo**

È un servizio di counselling



**Scopri quanto ne  
sai su tabacco e  
nicotina**



**Guida per  
smettere di  
fumare**



**Counselling  
proattivo**

Un operatore del servizio potrà



## E-Cig Policies

Limit Access to E-cigarettes

Ban advertising



## E-Cig Education

Educate Physicians to Screen

Raise Awareness in Schools



## Interventions targeting dual smoking and e-cigs

Develop evidence-based public health and primary care interventions

Develop accessible cessation apps



Falconara Marittima





Bruxelles



Scientific societies, organizations and regulatory authorities

Tobacco Industry



*Bush A, et al. Front Pediatr. 2021; 9: 698613*



*Ferkol TW et al. Eur Respir J. 2018; 51: 1800278*



*Grigg J. ERJ. 2021; 57: 2003499*  
*Chen DT et al. ERJ. 2024; 63: 2301808*



Home / News / Urgent action needed to protect children and prevent the uptake of e-

# Urgent action needed to protect children and prevent the uptake of e-cigarettes

14 December 2023 | News release | Reading time: 3 min (692 words)

14 dicembre 2023



World Health Organization  
(WHO) ✓

8 h · 🌐

Kids are targeted at an early age to use e-cigarettes & may get hooked on nicotine. This can affect their brain development & lead to learning disorders.

"Kids are being recruited and trapped at an early age to use e-cigarettes and may get hooked to nicotine," said Dr Tedros Adhanom Ghebreyesus, WHO Director-General. "I urge countries to implement strict measures to prevent uptake to protect their citizens, especially their children and young people."

E-cigarettes with nicotine are highly addictive and are harmful to health. Whilst long-term health effects are not fully understood, it has been established that they generate toxic substances, some of which are known to cause cancer and some that increase the risk of heart and lung disorders. Use of e-cigarettes can also affect brain development and lead to learning disorders for young people. Fetal exposure to e-cigarettes can adversely affect the development of the fetus in pregnant women. Exposure to emissions from e-cigarettes also poses risks to bystanders.

# Giornata mondiale contro il fumo 2024



*“Protecting children from tobacco industry interference”*



Health Topics ▾

Countries ▾

Newsroom ▾

Emergencies ▾

Data ▾

About WHO ▾

Home / Campaigns / World No Tobacco Day / World No Tobacco Day 2024

The industry targets youth for a lifetime of profits, creating a new wave of addiction. Children are using e-cigarettes at rates higher than adults in all regions and globally an estimated 37 million youth aged 13-15 years use tobacco.

**World No Tobacco Day 2024**

31 May



# L'impegno della SIMRI



***Teschio con sigaretta accesa***

*Vincent van Gogh 1885-86*

*Van Gogh Museum, Amsterdam*



TASK FORCE SIMRI –

***“Vaping in Children and Adolescents:  
Harms and Strategies to Promote  
Preventive Interventions”***

*Michele Ghezzi, Maria Elisa Di Cicco*



# SIMRI Call to action for pediatricians:

## 10 rules to protect our children from vaping exposure

1. Pediatricians must be **aware** that mounting evidence shows that vaping threatens children' health and particularly respiratory health, in a similar way cigarettes do, and that they should routinely screen their patients and families for vaping.
2. Children and adolescents are at increased risk of **addiction** to nicotine, and they should be protected from tobacco industry interference especially on social media.
3. **First-hand exposure** to vaping may cause acute and chronic lung damage, and respiratory symptoms such as cough, phlegm, dyspnoea, wheezing and asthma exacerbations.
4. **Second and third - hand exposure** to vaping is likely to be harmful and should be avoided, especially in childhood.
5. **Pregnant** women must be routinely screened for vaping, and informed and counselled on the risks related to vaping during pregnancy.
6. Even if there is still no clear evidence on e-liquids and vaping **carcinogenicity**, following the precautionary principle it is strongly suggested to avoid any kind of exposure, especially if prolonged.
7. It is mandatory to ensure smoke-free and vaping-free **environments**, including indoor locations.
8. We suggest electronic nicotine delivery systems should be **regulated as tobacco products**, including bans on flavorings and on child-friendly packaging.
9. **Tobacco policy** across Europe should be aligned with the objectives and political efforts promoted by the World Health Organization.
10. Urgent implementation of **prevention campaigns and counseling plans** focused on the risks of vaping in schools should be promoted locally and at a national level

# Anche la Società Italiana di Pediatria ha preso posizione sul tema

2023



Società Italiana di Pediatria

21 October 2023 · 🌐

Il fenomeno delle sigarette elettroniche rappresenta un problema di salute pubblica che necessita di attenzione immediata con una chiara regolamentazione della vendita e della distribuzione. Occorre educare gli adolescenti e le loro famiglie sui rischi noti e potenziali associati a questi prodotti.

I pediatri della SIP sottolineano la necessità di una legislazione analoga a quella sul controllo del tabacco per contrastare il progressivo aumento dell'uso tra i giovani.

🌐 Nel primo commento, trovi l'approfondimento con tutti i dati tratti dagli studi più recenti.

2024

**WEBINAR**  
**WEBINAR Ambiente e Salute**  
**Sigarette elettroniche e salute negli adolescenti**  
**31 GENNAIO 2024 ore 18**

## Sigarette elettroniche: rischi, dipendenza e raccomandazioni

Le sigarette elettroniche (ENDS) hanno rapidamente guadagnato popolarità tra gli adolescenti

← Swipe

 Società Italiana di **Pediatria**

Le **sigarette elettroniche** rappresentano una vasta categoria di dispositivi, disponibili in due forme principalmente, i **sistemi "heat-not-burn"** e **"pod-mod"**.

**27,5%**

degli studenti delle scuole superiori utilizza correntemente le e-cigarettes

**10,5%**

degli studenti delle scuole medie utilizza correntemente le e-cigarettes



# 1 febbraio 2024 - Una lettera per il ministro Schillaci



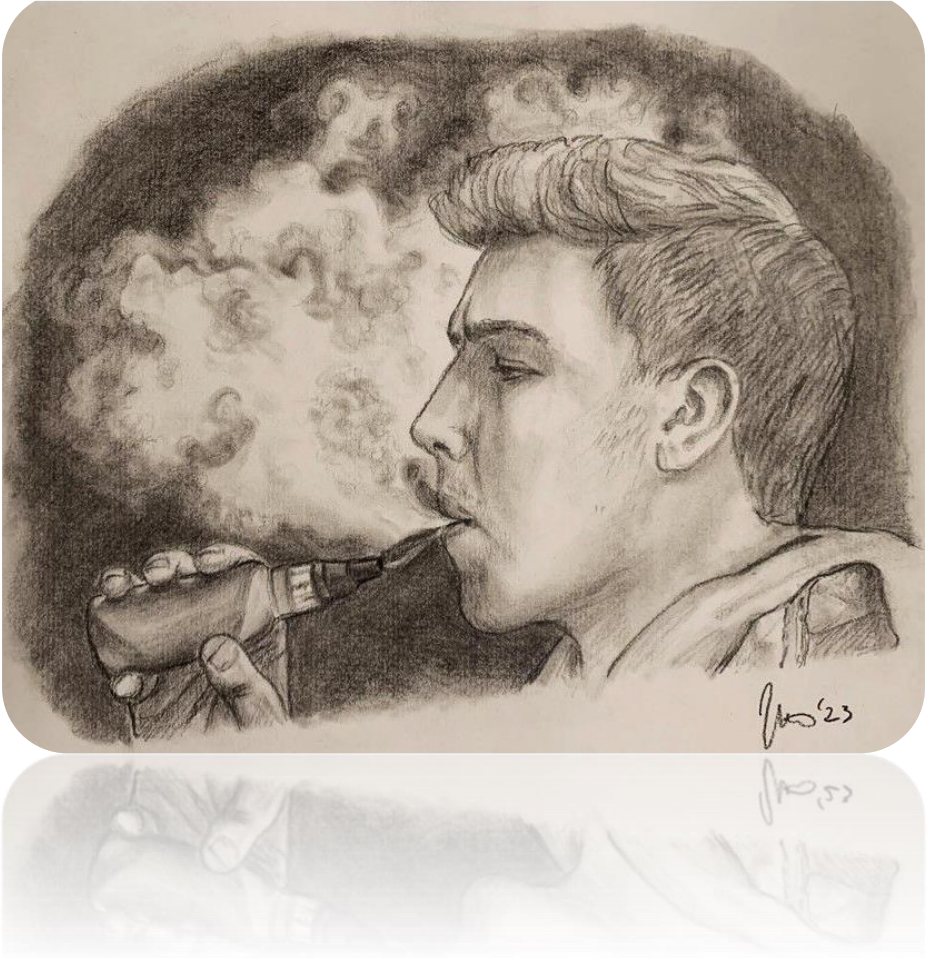
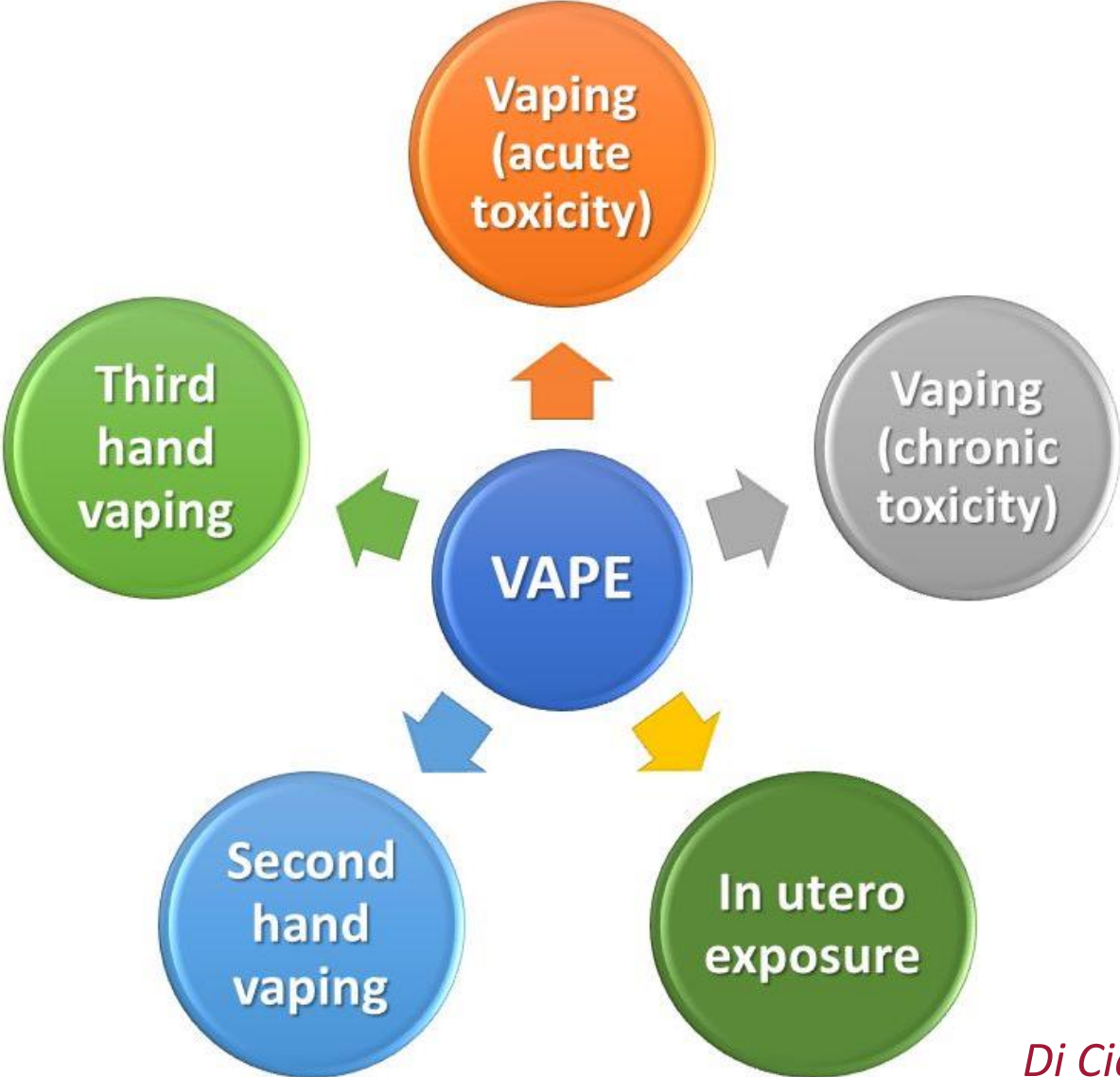
**Pediatri e Associazioni dei pazienti scrivono a Schillaci: sigarette elettroniche rischiose per la salute dei ragazzi, serve regolamentazione.**

## Comunicato stampa

**Pediatri e Associazioni dei pazienti scrivono a Schillaci: sigarette elettroniche rischiose per la salute dei ragazzi, serve regolamentazione.**

*In una lettera alcune proposte: rigoroso controllo della vendita ai minori, regole per le aromatizzazioni e campagne di comunicazione.*

# Cosa vi ricorda tutto questo?



*Di Cicco M et al. New threats for pediatric respiratory health: beware of vaping. Ped Respir J. 2023; 1: 16-25*



# SMOKING *and* HEALTH

REPORT OF THE ADVISORY COMMITTEE  
TO THE SURGEON GENERAL  
OF THE PUBLIC HEALTH SERVICE



U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Public Health Service

HERE WE  
GO AGAIN

In 1964, Luther L. Terry, Surgeon General of the U.S. Public Health Service, released the first report of the Surgeon General's Advisory Committee on Smoking and Health. On the basis of more than **7,000 articles** relating to smoking and disease already available at that time in the biomedical literature, the Advisory Committee concluded that cigarette smoking is:

- A cause of lung cancer and laryngeal cancer in men
- A probable cause of lung cancer in women
- The most important cause of chronic bronchitis

*Terry L. Smoking and health: report of the Advisory Committee to the Surgeon General of the United States. In: U-23 Department of Health, Education and Welfare. Washington DC: Public Health Service Publication No. 1103; 1964*

Fool me once  
Shame on you  
Fool me twice  
Shame on me



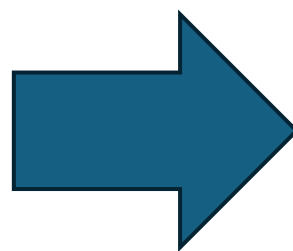
*“The Industry fooled us once over **tobacco**, will we let them fool us a second time over **vapes**?”*

**BEWARE!**

Attenzione a quello che leggete...

Tono tendenzialmente  
positivo verso gli ENDS

Molti e ripetuti «but»



...Andate a leggere le  
**disclosures...**  
(soprattutto se scritte  
con carattere piccolo  
e fitte fitte)

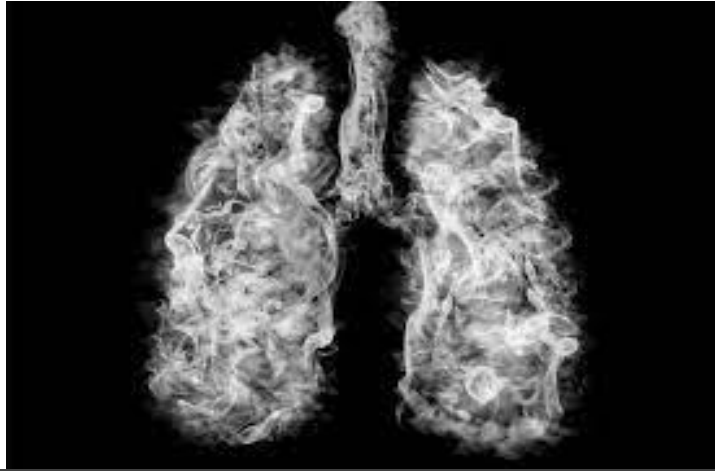
WHICH IS LEAST HARMFUL?



*The most effective strategy  
to reduce harm from smoking  
is to stop **all** tobacco and  
nicotine product use*

*Farber HJ et al. Ann Am Thorac Soc.  
2024 Oct; 21(10): 1372-4*





*The human lungs are created to breathe clean air, not “reduced levels of toxins and carcinogens”*

*Bhatt JM et al. Paediatr Respir Rev. 2020; 36: 75-86*



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***Grazie per l'attenzione!***



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