# Welcome to the CIAQ Webinar/Meeting
# Wednesday, October 16, 2019
# 1:00 p.m. – 4:30 p.m. EDT

Please stand by—the CIAQ Webinar will begin momentarily.
Thank you.

**Operator-Assisted Conference Line: 1-855-883-8661**
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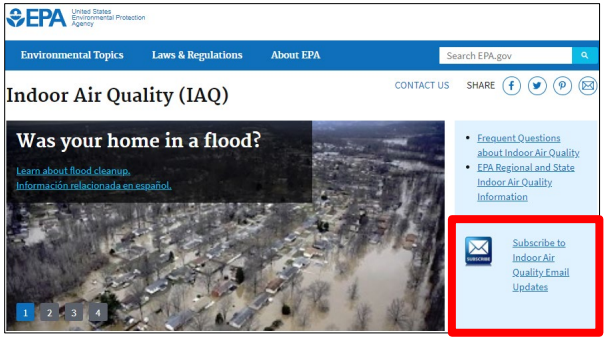


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# Welcome to the CIAQ Webinar/Meeting
# Wednesday, October 16, 2019
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EPA United States Environmental Protection Agency

CIAQ Federal Interagency Committee on Indoor Air Quality

Audio: **1-855-883-8661** / Passcode: **2973518**

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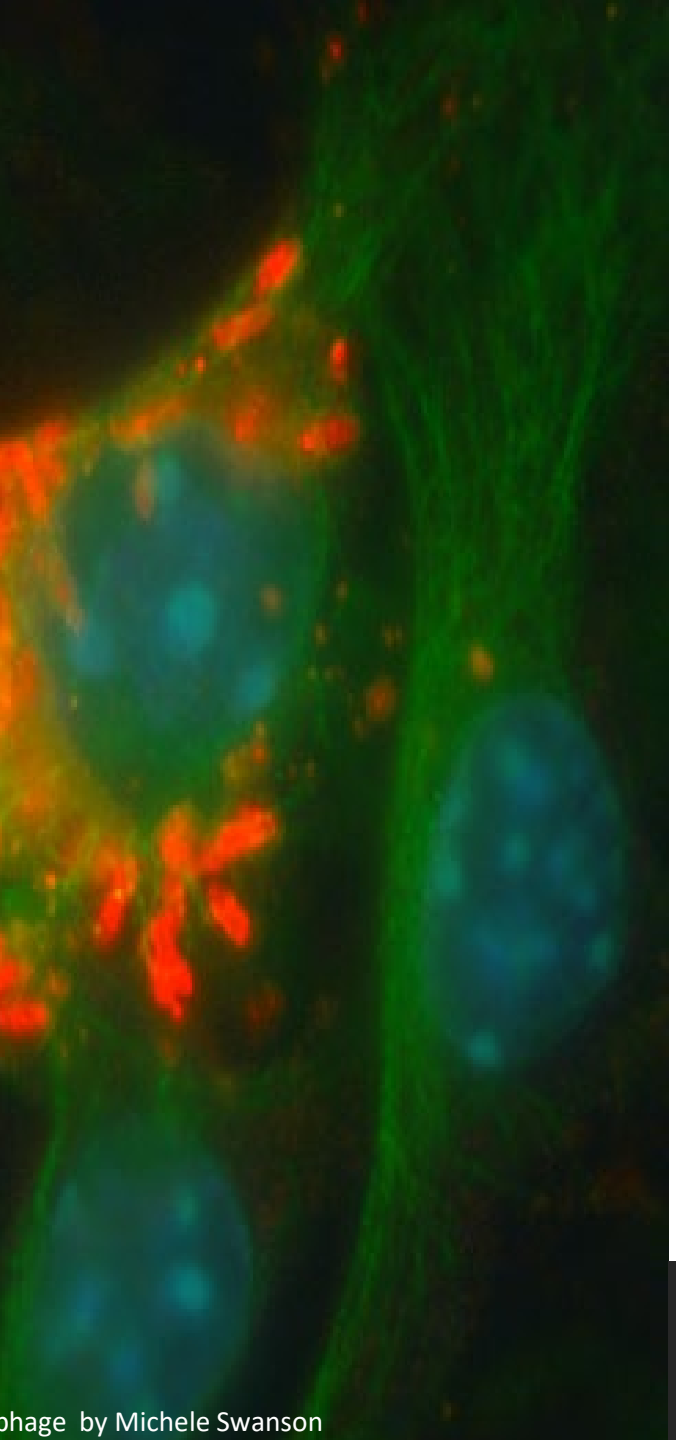
- **Welcome, introductions and announcements—***Laureen Burton, Moderator, U.S. Environmental Protection Agency (EPA)*
- **Updates on IAQ & IEQ activities from Federal CIAQ Member Agencies**
  1. *U.S. Department of Energy (DOE)*
  2. *National Institute of Standards and Technology (NIST)*
  3. *Consumer Product Safety Commission (CPSC)*

  **Q&A (DOE, NIST, CPSC updates)**
  4. *U.S. Department of Housing and Urban Development (HUD)*
  5. *U.S. EPA*

  **Q&A (HUD and EPA updates)**

- **IAQ Area of Interest Presentations**

  - **The National Academies of Sciences (NAS) Management of *Legionella* in Water Systems**
    - **Laura J. Ehlers, Ph.D.,** Senior Staff Officer, Water Science and Technology Board, The National Academies of Sciences
  - **E-cigarettes and Vaping: Updates on the State of the Science, Potential Public Health Impacts, and Indoor Environmental Smokefree Indoor Air Policies**
    - **Brian A. King, Ph.D., M.P.H.,** Deputy Director for Research Translation, CDC's Office on Smoking and Health
    - **Cynthia Hallett, M.P.H.,** President & CEO, American Nonsmokers' Rights Foundation



phage by Michele Swanson

The National Academies of Sciences, Engineering and Medicine
Water Science and Technology Board

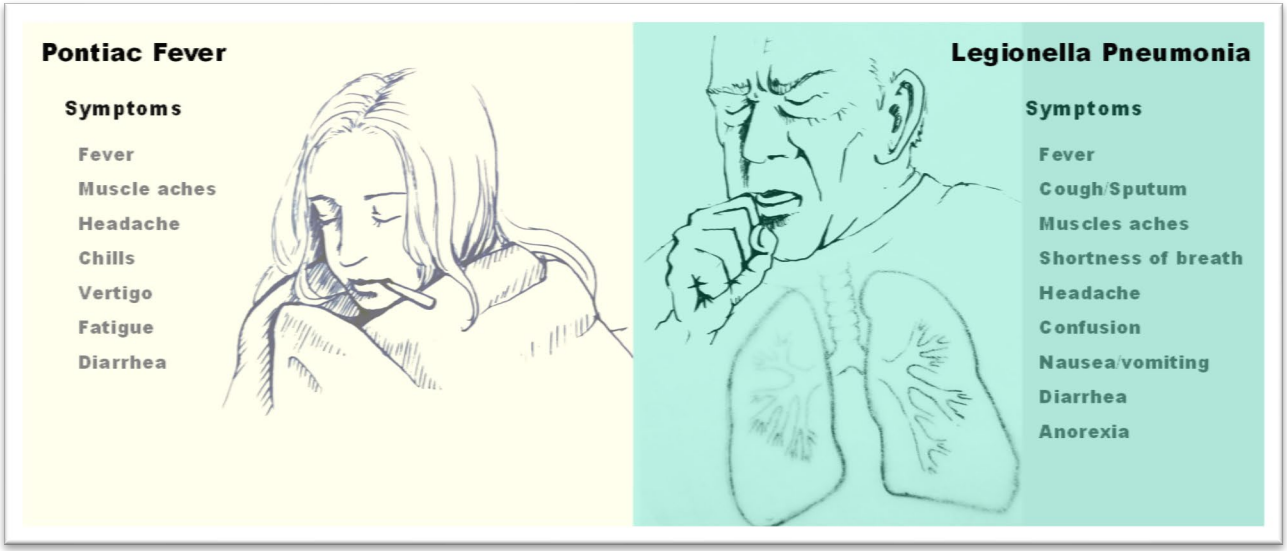
# Management of *Legionella* in Water Systems

Laura J. Ehlers
Study Director

Federal Interagency CIAQ Meeting
October 16, 2019

# Legionellosis

- Caused by the bacterium *Legionella*: 80–90 percent of reported cases are linked to *Legionella pneumophila.*
- **Legionnaires' disease (LD)** is a pneumonia-like syndrome with 3 percent to 33 percent cases leading to death.
  - **96 percent sporadic, 70 percent community acquired**
- **Pontiac fever** is an acute, nonfatal mild upper respiratory infection that resembles acute influenza. Pontiac fever resolves spontaneously and often goes undiagnosed.




## Risk factors for legionellosis:

- Age
- Gender
- Smoking
- Immunosuppression

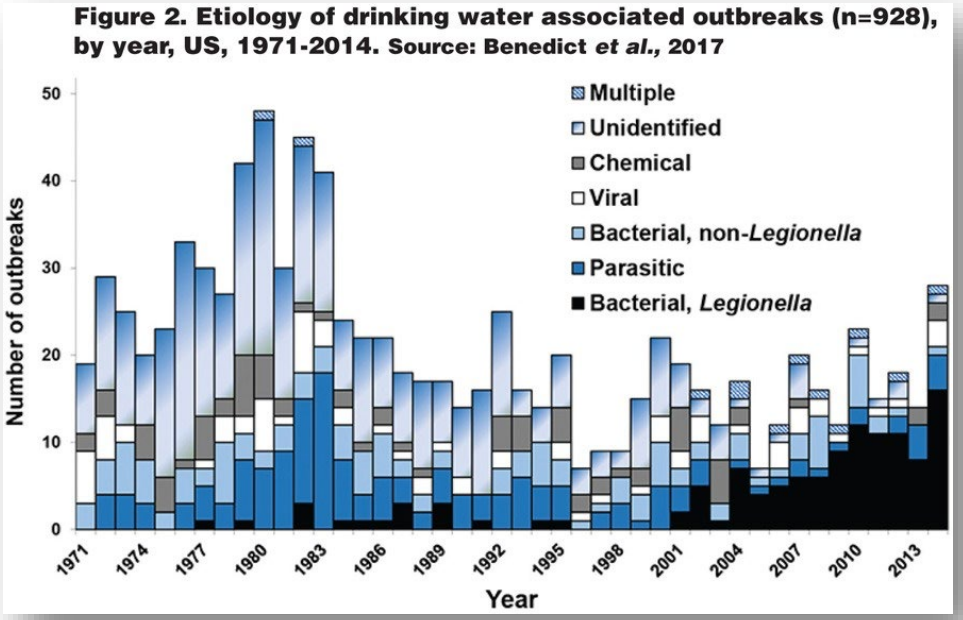
# Public Health Hospitalization Costs Associated With Contaminated U.S. Drinking Water

CDC estimates drinking water disease costs > $970 million/year.

- Less so fecal pathogens
- Largely Legionnaires' disease, otitis externa, and non-tuberculous mycobacterial with >40,000 hospitalizations/year

| Disease | Annual costs |
|---|---|
| Cryptosporidiosis | $46M |
| Giardiasis | $34M |
| Legionnaires' disease | **$434M** |

SOURCE: Collier *et al.* (2012) Epi Inf 140(11): 2003-13

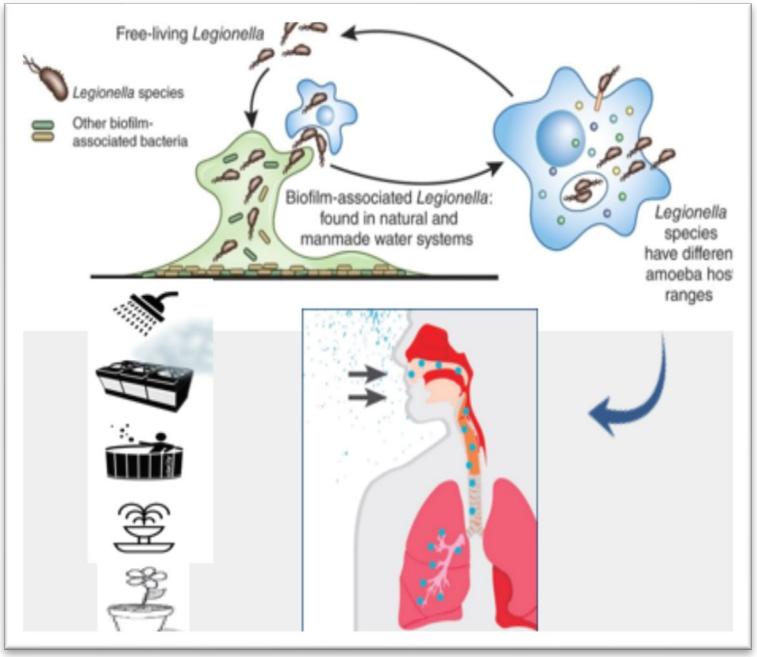



SOURCE: Benedict et al. (2017)

# *Legionella* Transmission Primarily Through Inhalation of Contaminated Aerosols Into the Respiratory System

**Some of the common sources of infection include—**

- Showers and faucets
- Cooling towers (parts of large air conditioning systems)
- Hot tubs
- Decorative fountains

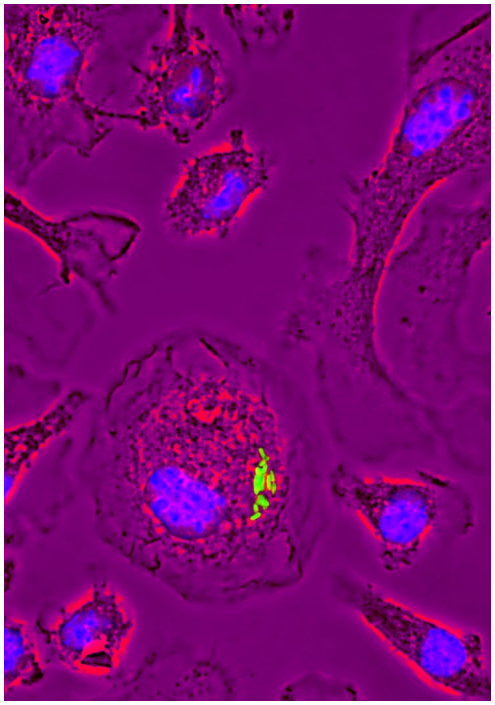



# Outbreaks of Legionnaires' Disease

- **Dutch flower show:** 1999, over 300 cases, 32 deaths, whirlpool spas and sprinklers
- **Melbourne aquarium:** 2000, 125 cases, 4 deaths, cooling tower
- **Norway wastewater treatment plant:** 2005, 56 cases, 10 deaths, wastewater aeration ponds
- **Toronto:** 2013, 43 cases, unknown source
- **Portugal cooling tower:** 2014, 377 cases, 14 deaths, cooling tower
- **New York City (Bronx) cooling tower:** Summer 2015, 128 cases, 12 deaths, cooling tower
- **Flint (MI) water supply changes:** 2014-2015, more than 80 cases, 12 deaths
- **Quincy (IL) State Veterans' Home premise plumbing:** 2016, more than 57 cases, 14 deaths, contaminated premise plumbing

# 40 years since the discovery of *L. pneumophila*

- **Much has been learned about the bacteria's biology and ecology.**
- **Less progress has been made in preventing Legionnaires' disease.**
- **Methods for monitoring both the disease incidence and water samples have evolved.**
- **Treatment of water systems to reduce colonization is not well understood.**



***In late 2017, the National Academies of Sciences, Engineering, and Medicine convened an expert committee (the Committee on Management of Legionella in Water Systems) to review the state of the science with respect to Legionella contamination of water systems and issue a report.***

# Committee's Statement of Task

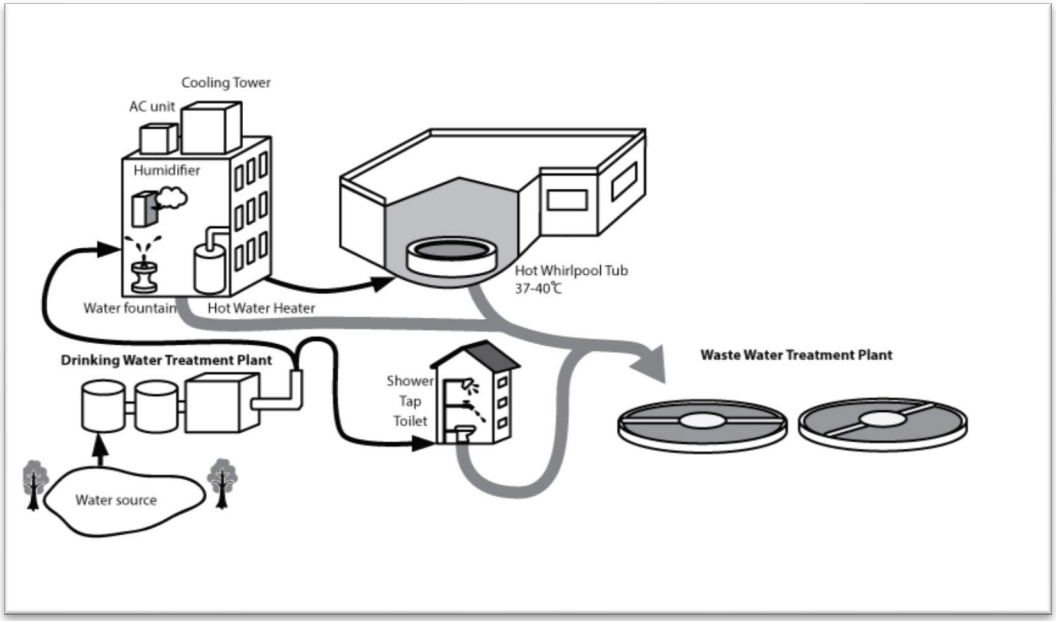
- **Ecology and Diagnosis:** Describe the microbial ecology of water supplies as it relates to *Legionella*. How can diagnosis be improved?
- **Transmission via Water Systems:** What are the primary sources of human exposure to *Legionella*? What features/characteristics of water systems make them likely to support growth of *Legionella?*
- **Quantification:** What is known about the concentration of *Legionella* in water systems *and* the prevalence of Legionnaires' disease over the last 20 years? Is there a minimum level of contamination required to cause disease?
- **Prevention and Control:** What are the most effective strategies for preventing and controlling *Legionella* amplification in water systems?
- **Policy and Training Issues:** What policies, regulations, codes, or guidelines affect the incidence, control, quantification, and prevention of Legionnaires' disease? How might they be built upon to better protect the public?

# Committee Members

**Laura Ehlers**, Senior Staff Officer, NASEM

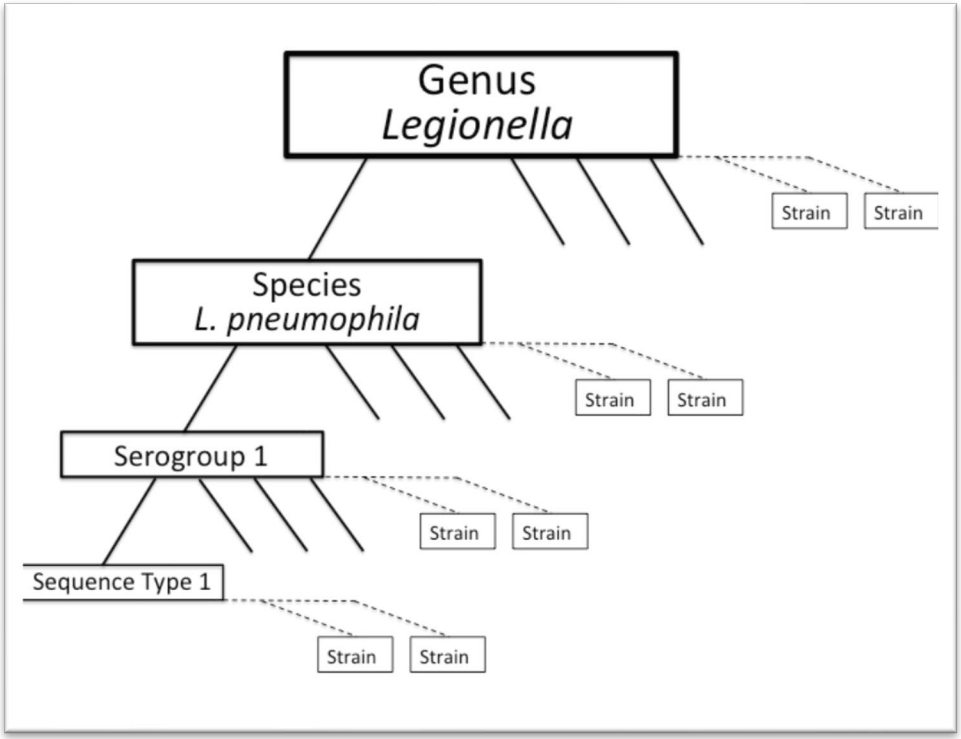
1. **Joan B. Rose,** *Chair,* Michigan State University, Lansing
2. **Nicholas J. Ashbolt**, University of Alberta, Edmonton
3. **Ruth L. Berkelman**, Emory University, Atlanta, GA
4. **Bruce J. Gutelius**, New York City Department of Health and Mental Hygiene
5. **Charles N. Haas**, Drexel University, Philadelphia, PA
6. **Mark W. LeChevallier**, Dr. Water Consulting LLC, Morrison, CO
7. **John T. Letson**, Memorial Sloan Kettering, Bronxville, NY
8. **Steven A. Pergam**, Fred Hutchinson Cancer Research Center and the University of Washington
9. **Michèle Prévost**, Polytechnique Montréal, Quebec
10. **Amy Pruden**, Virginia Polytechnic Institute and State University, Blacksburg
11. **Michele S. Swanson**, University of Michigan, Ann Arbor
12. **Paul W. J. J. van der Wielen**, KWR Watercycle Research Institute, Nieuwegein, The Netherlands
13. **Lan Chi Nguyen Weekes**, La Cité, Ottawa, ON

# Chapter 1: INTRODUCTION



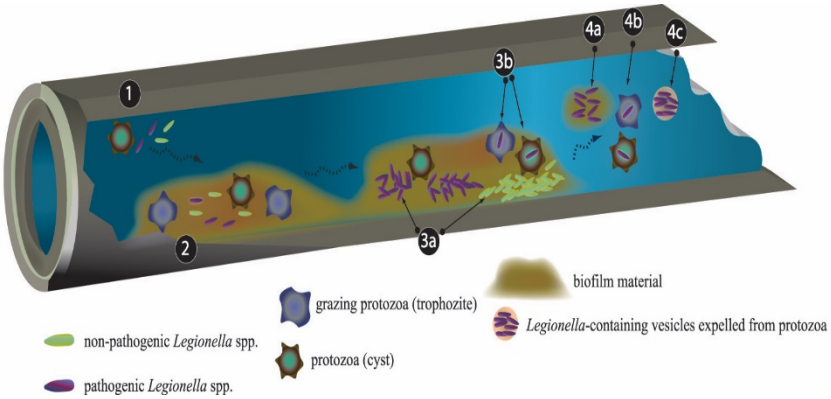

- *Legionella* was first documented as a cause of human disease in 1976, after an outbreak of pneumonia of unknown origin was described among members of the American Legion who had attended a conference at the Bellevue-Stratford Hotel in Philadelphia.
- The history and evolution of knowledge on this waterborne disease is recorded to a large extent via outbreaks.
- It is clear that the built environment is a major ecological niche for the bacteria and controls focus on biocides for cooling towers and hospitals.

# Chapter 2 DIAGNOSIS, ECOLOGY AND EXPOSURE PATHWAYS

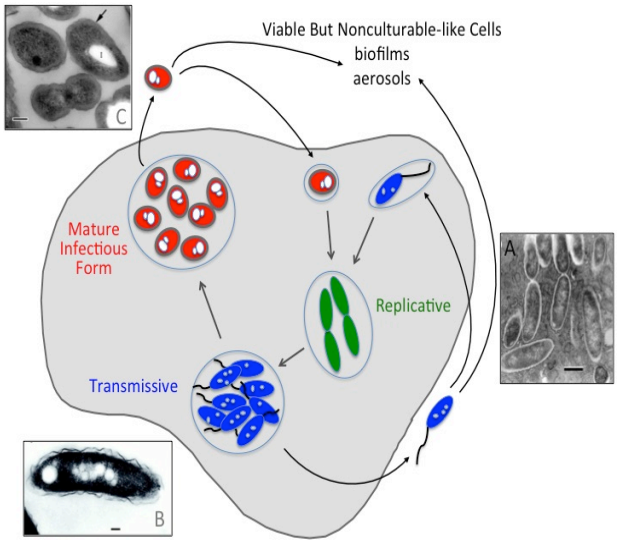



- There are 61 known species of *Legionella.*
- *L. pneumophila* is the most dominant species isolated from patients.
- Other pathogenic species include *L. micdadei, L. bozemanii, L. dumoffi and L. longbeachae.*
- Genetics and complex ecology of *Legionella* are being revealed.

# Chapter 2
# DIAGNOSIS, ECOLOGY AND EXPOSURE PATHWAYS



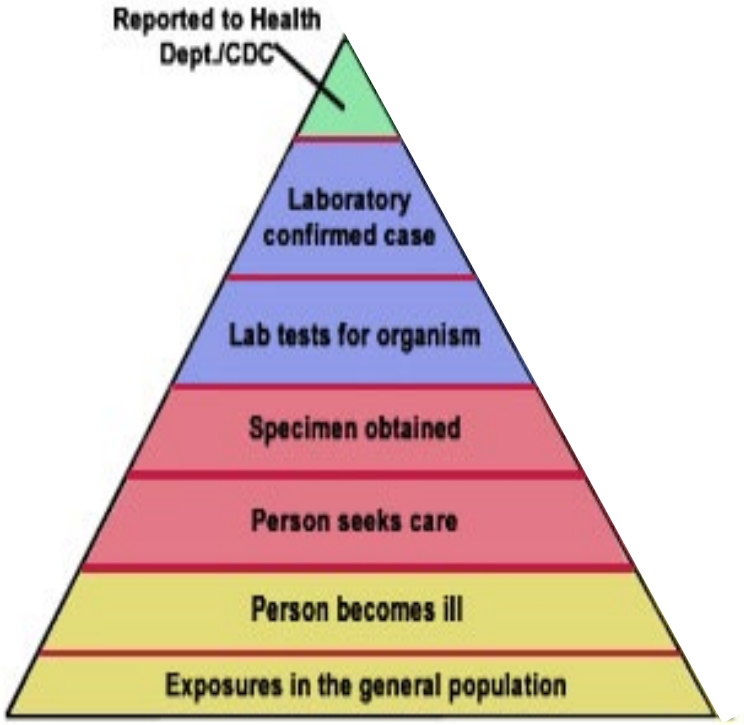

- **The bacteria can exist in numerous forms: transmissive, replicative, and mature infectious, as well as viable-but-nonculturable (VBNC) forms.**
- **The primary growth habitat of *L. pneumophila* is within amoebae or other free-living protozoa associated with biofilms.**
- **There are various forms of packaged *Legionella* that are released.**
- **Cell forms, and how they are packaged, differ in their infectivity, virulence, resistance to treatment, etc.**



# Chapter 2 Conclusions and Recommendations

- Protocols should be developed to generate, identify, enumerate, and report **distinct *Legionella* cell types.**
- Whether *L. pneumophila* enters into a **VBNC state** that is both resilient and reversible remains an urgent question.
- Ecological studies should be **focused on** the growth, survival, and inactivation of **other *Legionella* species.**
- Direct observations and metagenomic studies of microbial diversity are required to identify the **protozoa** that control pathogenic *Legionella.*
- How does *Legionella* cause **Pontiac fever?** Role of the **aspiration pathway** to total disease? Survival of *Legionella* in **aerosols?**

# Chapter 3: QUANTIFICATION OF *LEGIONELLA* AND LEGIONNAIRES' DISEASE




**Topics covered:**

- Disease surveillance for Legionnaires' disease
- Committee's estimated rate for Legionnaires' disease
- Environmental monitoring of *Legionella*
- Compilation of *Legionella* data from across the world
- Quantitative Microbial Risk Assessment for *Legionella pneumophila*

# Evolving Methods for Quantification of *Legionella*

**Purpose: Diagnosis, Outbreak Investigation, Routine Monitoring, Mitigation Assessment, and Research**

- Urinary antigen test (UAT) which detects only *Lp1*
- Certified standard culture methods vs. New culture methods
- Quantitative PCR/droplet digital PCR

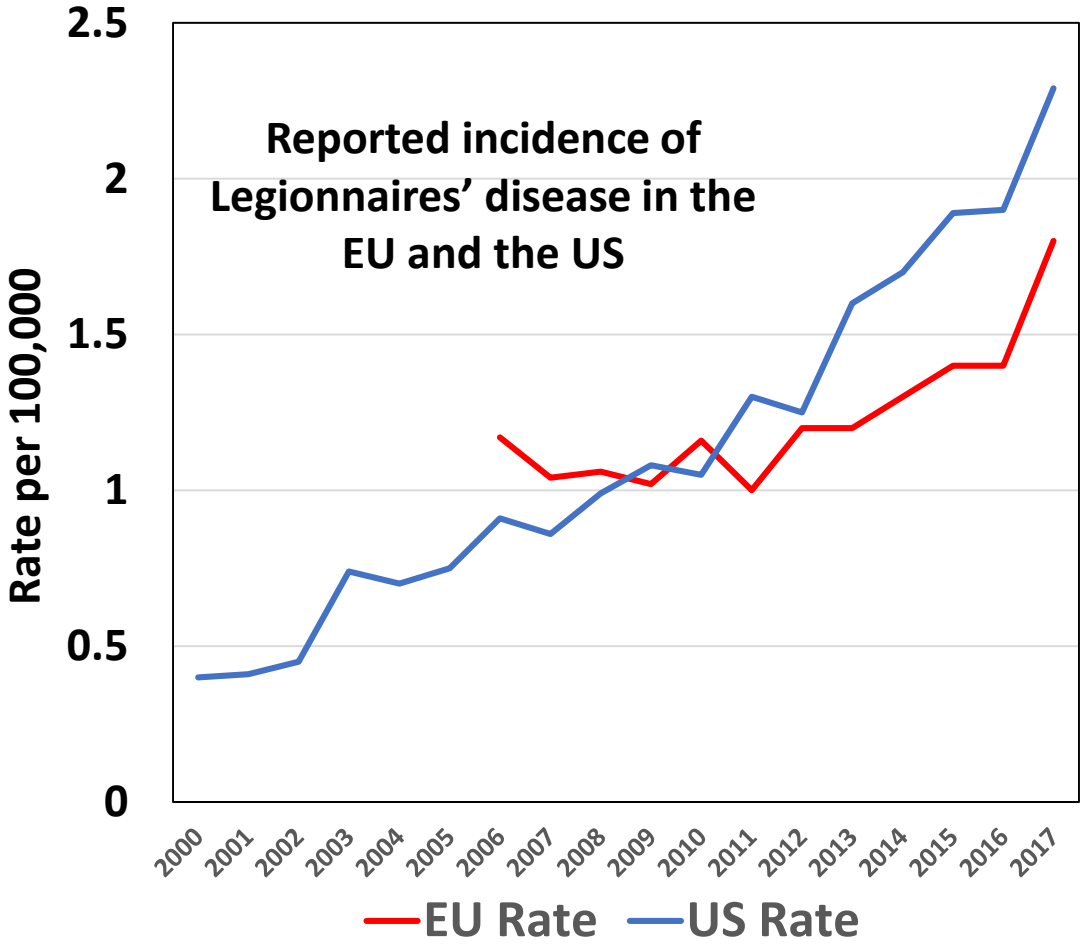
  (*L spp., Lp, Lp1, L.anisa, L.micdadei, L.longbeachae, L.bozemanii*)
- Sequencing
- Associated amoeba


*Legionella* on Charcoal Yeast Extract Agar

- ✓ **The diagnosis of LD caused by *Legionella* spp. other than *Lp1* is very difficult with the current routine approaches.**
- ✓ **Need evaluation, training, proficiency testing, national approaches for surveillance.**
- ✓ **New investment in modified culture and molecular tools is needed.**

# Committee Estimate of Current Rates

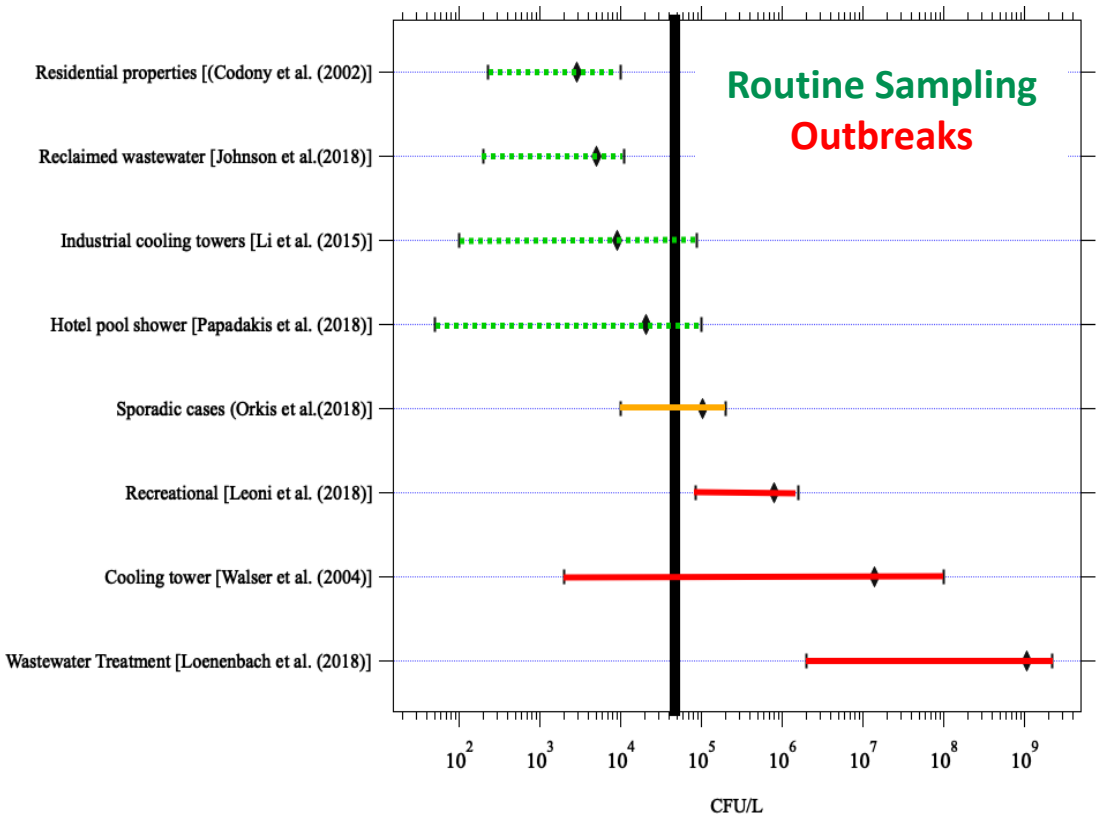
- The Committee conservatively estimated that the number of persons with Legionnaires' disease ranges from **52,000 to 70,000 in the United States each year** or a rate of 20.5 to 27.4/100,000.




- ***Estimate is about 10 times higher than the current reported disease incidence.***
- ***This extent of underestimation of national reported data is supported by other studies.***

# Range of Environmental Concentrations Without and With Observed Disease Outbreaks

A *Legionella* concentration of **5 x $10^4$ CFU/L** should be considered an "action level"—that is, a concentration high enough to warrant serious concern and trigger remediation.




***A lower level may be necessary for at-risk individuals.***

# QMRA Derived Concentrations for Devices/Fixtures Corresponding to Reference Infection Risks and DALYs

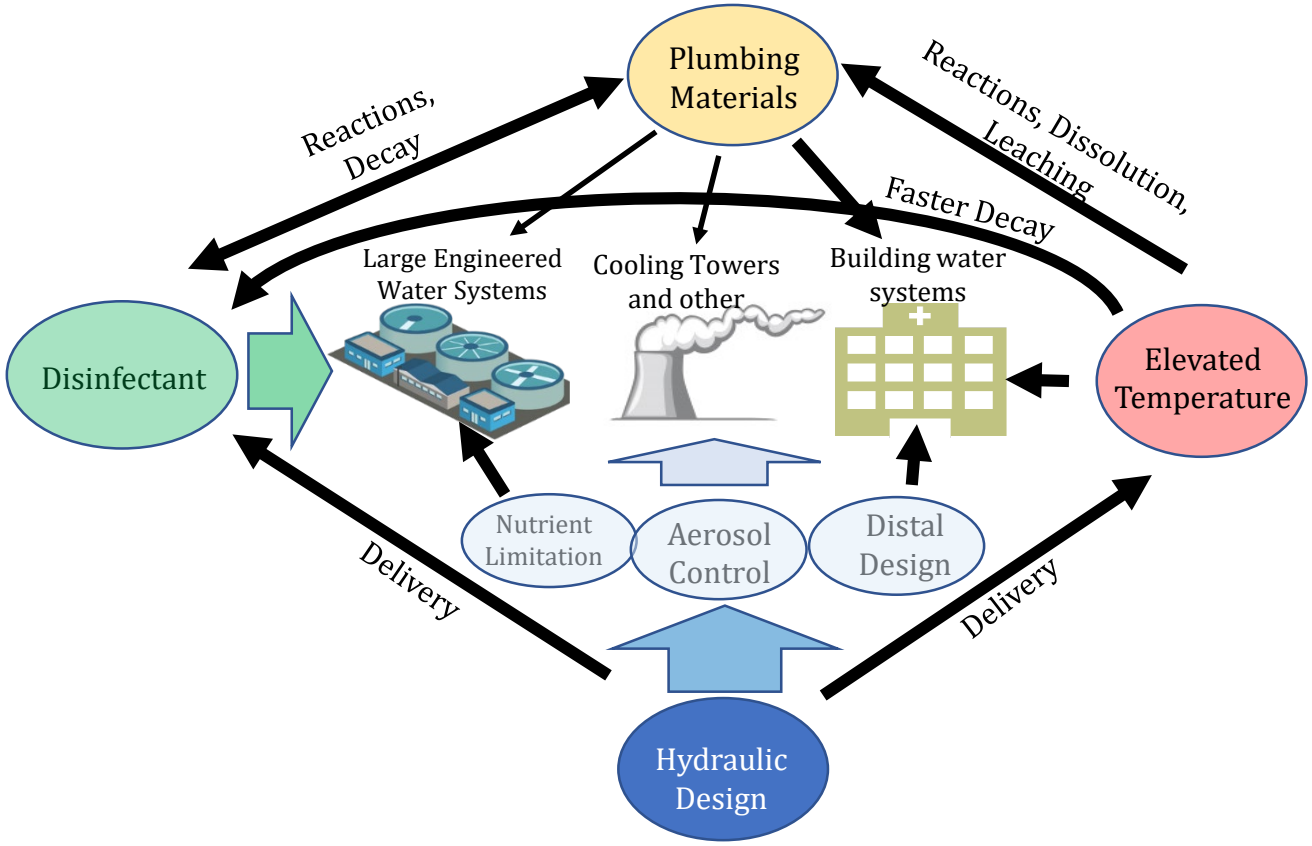
| Devices/Fixtures | Critical Average *Lp* Concentration (CFU/L) |
|---|---|
| ***Target Risk Value: $10^{-4}$ infections per person per year*** | |
| **Conventional faucet** | 104,000 |
| **Conventional toilet** | 857,000 |
| **Conventional shower** | 1,410 |
| ***Target Risk Value: $10^{-6}$ DALY per person per year*** | |
| **Conventional faucet** | 1,060 |
| **Conventional toilet** | 8,830 |
| **Conventional shower** | 14.4 |

*L. pneumophila* concentrations in various plumbing fixtures that correspond to target risk levels.
**NOTE:** Median estimates from a Monte Carlo simulation.
**SOURCE:** Hamilton et al. (2019).

# Chapter 3 Conclusions and Recommendations

- Urgent need to **develop better clinical tools** that will capture more cases of Legionnaires' disease and identify pathogenic *Legionella* beyond *Lp1.*
- Determining the most common sources of **sporadic disease** will require well-funded, population-based studies in multiple jurisdictions.
- **Regional Centers of Excellence** could serve as a backbone to strengthen the capacity of state health departments to detect and investigate cases of LD.
- **Systematic comparison** of culture methods for *Lp* (and other pathogenic legionellae) ddPCR, qPCR, viability-qPCR, and reverse transcriptase qPCR needed.
- **Quantitative microbial risk assessment** is ready to determine concentrations that could be used to set standards/targets for routine monitoring, for determining the effectiveness cleanup, and for regulations.

**Chapter 4: STRATEGIES FOR *LEGIONELLA* CONTROL AND THEIR APPLICATION IN BUILDING WATER SYSTEMS**




**Topics covered:**

- Main control strategies for *Legionella*
- Their application to different building and device types
- Confounding influence of green buildings and water and energy conservation
- *Future of prebiotic and probiotic controls*
- *Other opportunistic pathogens in buildings*

# Strategies for *Legionella* in Various Water Systems

| Control Strategy | Building Water Systems | | | Large Engineered Systems | | | Other Devices | | |
|---|---|---|---|---|---|---|---|---|---|
| | Large Institutional Buildings | Green Buildings | Households | Potable Water Supply | Wastewater Treatment | Reclaimed Water Systems | Cooling Towers | Humidifiers | Hot Tubs |
| **Temperature Control** | √ | X | √ | ? | | | ? | √ | |
| **Disinfection** | √ | √ | ? | √ | ? | √ | √ | | √ |
| **Manage Hydraulics** | √ | X | √ | √ | | √ | √ | √ | |
| **Nutrient Limitation** | | | | ? | | √ | | √ | |
| **Plumbing Materials** | √ | √ | √ | ? | | √ | √ | | |
| **Distal Portion of Plumbing** | √ | X | √ | | | | | | |
| **Aerosol Control** | √ | √ | √ | | √ | | √ | | |

**√**—Evidence of control working, **?**—Potential for control working but some limitations,
**X**—building type works against a control

# Chapter 4 Conclusions and Recommendations

- For all types of buildings, **hot-water heater temperature should be maintained above 60°C (140°F),** and **the hot-water temperature to the distal points should exceed 55°C (131°F).**
- Compared to free chlorine, a **monochloramine** residual better controls *Legionella* risk from distribution systems AND building water systems.
- Research is needed on the **persistence of distribution system disinfectant residuals within building plumbing.**
- Guidance about *Legionella* is needed for **homeowners.**
- **Low-flow fixtures should not be allowed** in hospitals and long-term care facilities because of these buildings' high-risk occupant populations.
- **New designs** are needed to help advance control of *Legionella* in **cooling towers and humidifiers.**
- **Green buildings and water and energy conservation** have worsened many of the problems with *Legionella.*

Chapter 5:
REGULATIONS AND GUIDELINES ON *LEGIONELLA* CONTROL IN WATER SYSTEMS

***The Safe Drinking Water Act does not provide protection from Legionella.***

- **The role of water utilities today**
  - Responsive to SDWA
  - Providing distribution system disinfectant residual
  - Responsibility ends at the service connection
- **Differences between premise plumbing and main distribution system (length, surface/volume ratio, water age)**
- **No evidence that residuals persist within buildings**

# Current Status of *Legionella* Management in the U.S. Today

**1. *Legionella* regulations in the United States that require water management plans and/or monitoring of water systems for *Legionella* currently cover:**

- Healthcare facilities in New York State
- Cooling towers in NYC and New York State
- Healthcare facilities within the VA system
- Hospitals/healthcare facilities receiving Medicare/Medicaid funds

**2. Voluntary creation of water management plans using such guidance as ASHRAE 188**

- Success in reducing building risk has been shown to be related to presence of a *Water Management Plan.*

**3. All other buildings and private residences are potentially protected from *Legionella* only through the application of building and plumbing codes, *which are inadequate.***

# Water Management Plans

**Water management plans capture what controls will be used in a building or for a device type to prevent growth of *Legionella.***

**Basic elements:**

- Establish a program team.
- Describe each water system.
- Analyze where potential hazards may exist, develop, or propagate.
- Identify control measures and where they should be applied.
- Monitor certain parameters (perhaps including *Legionella*) to determine if control measures are working.
- Confirm that the program is being implemented as designed (verification) and that the program effectively controls the hazard (validation).
- Document plan and analyses.

# Selected International *Legionella* Regulations

| Country/ Province | Buildings/Devices Covered | Preferred Treatment | Monitoring Thresholds (All Converted To CFU/L) |
|---|---|---|---|
| **Netherlands** | Priority premises (large buildings), swimming and bathing facilities, cooling towers | Temperature control, flushing, UV, filtration | >1,000 CFU/L, take response actions |
| **Germany** | Large buildings, cooling towers, swimming pools, bathing water, WWTPs | None, though temperature control and avoiding stag-nation evident in codes | >1,000 CFU/L, take response actions |
| **England** | Evaporative cooling systems, cooling towers, hot and cold water systems, spa/pool systems, healthcare facilities | Temperature control, biocides | 100-1000 CFU/L, take response actions |
| **France** | Buildings except private residences, cooling towers | None apparent | <1,000 CFU/L target for public facilities <50 or 100 CFU/L target for prevention of nosocomial infections |
| **Australia** | Premise plumbing in healthcare and aged care facilities, cooling towers | Temperature control, biocides | $>10^6$ CFU/L, take response actions |
| **Canada** | Cooling towers, open water systems, HVAC components, and hot- and cold-water systems in 360 government buildings | None | $>10^6$ CFU/L, take response actions |
| **Quebec** | Cooling towers only | Biocides | $\geq 10^4$ to $<10^6$ CFU/L, take response actions |

***Countries/Provinces that have evidence of lower environmental concentrations since regulations went into effect!**

# Chapter 5 Recommendations

1. Expand the Centers for Medicare & Medicaid Services memo **to require monitoring for *Legionella*** in environmental water samples for all hospitals.
2. **Register and monitor cooling towers.**
3. Require **water management plans in all public buildings** including hotels, businesses, schools, apartments, government buildings.
4. Require a temperature of **60°C (140°F) at hot-water heaters** and **55°C (131°F) to the distal points** (the point of connection to fixtures including thermal mixing values).
5. Require a **minimum disinfectant residual** throughout public water systems.

# Final Recommendations

- Guidance on interpretation of monitoring results
  - Including setting targets
- Training and education
- Analysis of the cost of implementation
- Report speaks to timing

# Report available

www.nap.edu/catalog/25474/management-of-legionella-in-water-systems

# THE RISE OF E-CIGARETTES:
## IMPLICATIONS FOR PUBLIC HEALTH POLICY AND PRACTICE

BRIAN A. KING, PHD, MPH | DEPUTY DIRECTOR FOR RESEARCH TRANSLATION

October 16, 2019

Centers for Disease Control and Prevention

National Center for Chronic Disease Prevention and Health Promotion

INTERAGENCY COMMITTEE ON SMOKING AND HEALTH

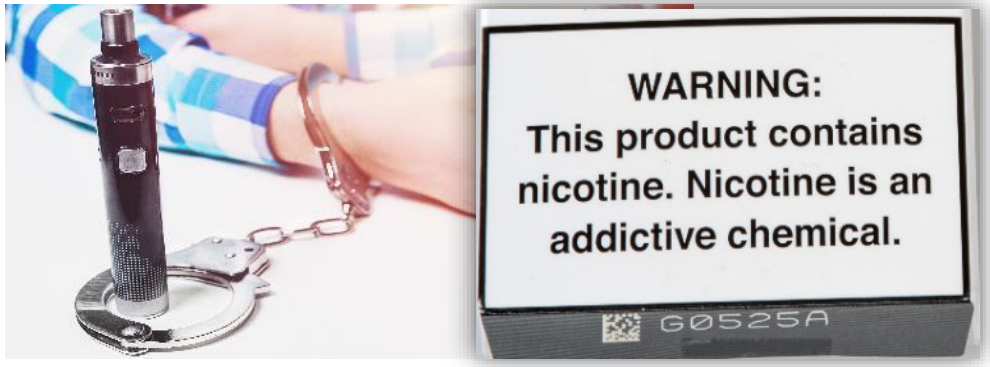
1

What's an E-cigarette?

2

Who's Using Them?

3




What Are The Health Effects?

4

What Can We Do About It?

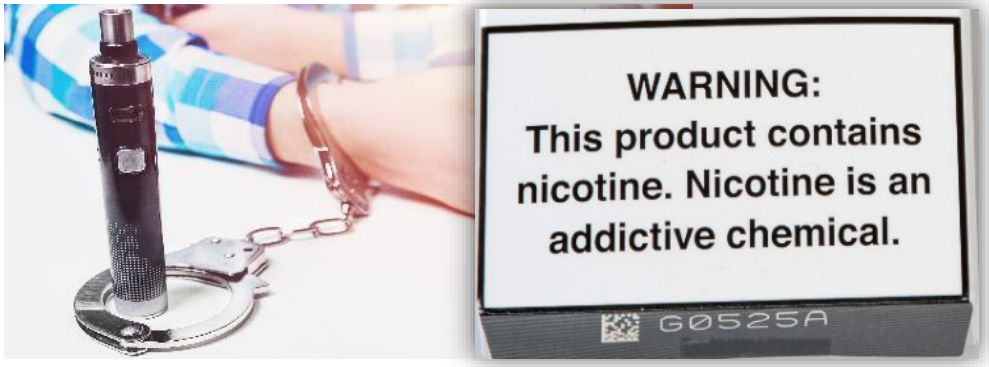
1

What's an E-cigarette?

2

Who's Using Them?

3

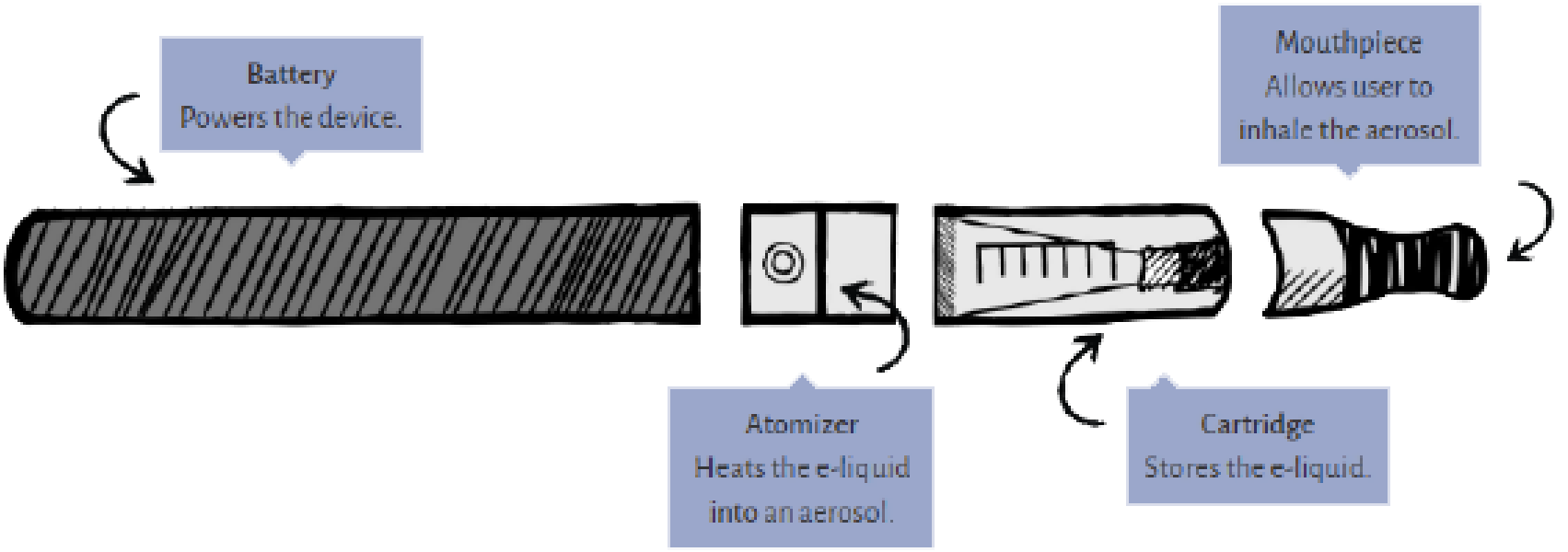



What Are The Health Effects?

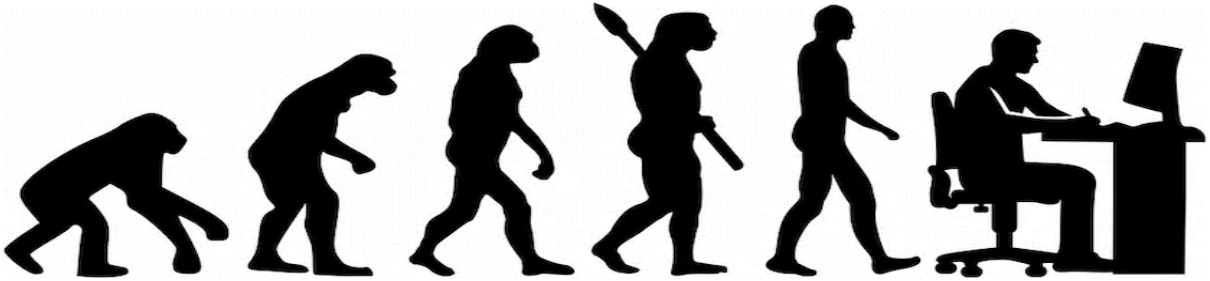
4

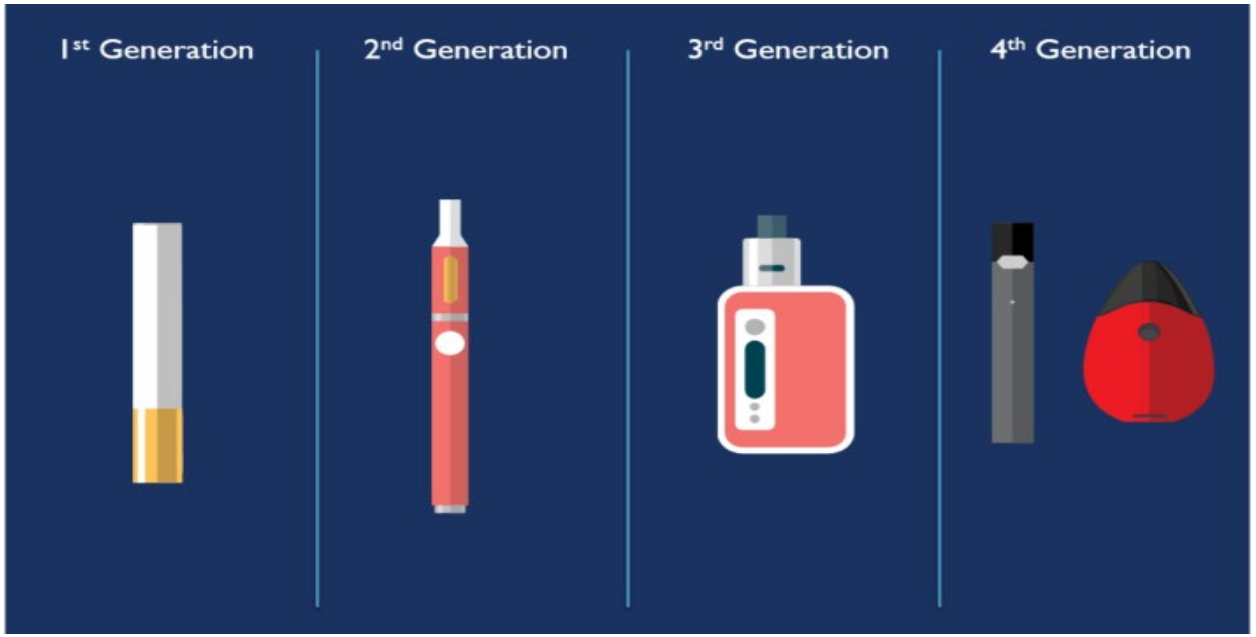
What Can We Do About It?

# ANATOMY OF AN E-CIGARETTE

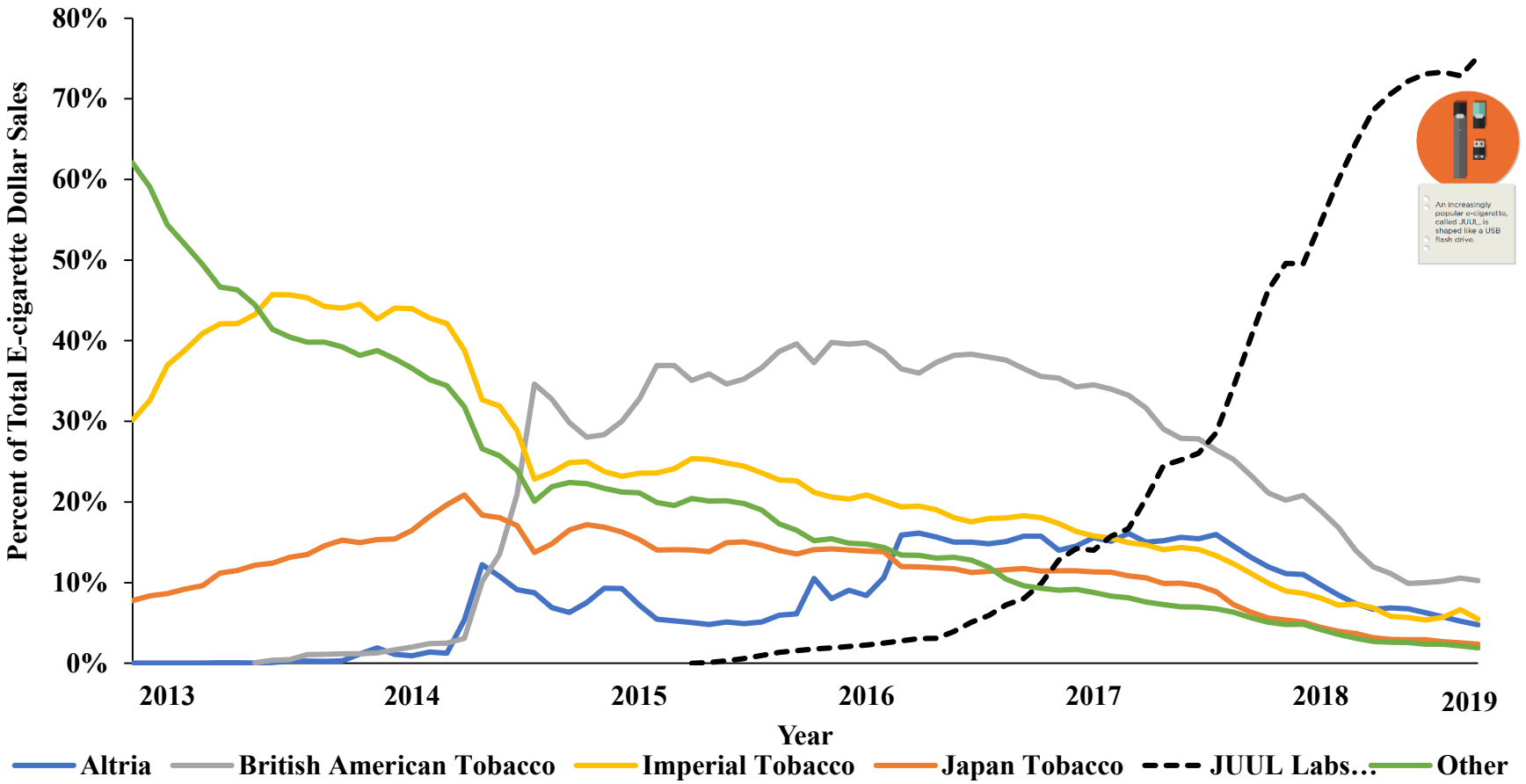


# THE EVOLUTION OF E-CIGARETTES





# E-CIGARETTE MARKET SHARE, BY DOLLAR SALES, US, 2013–2018




**Source:** King, Brian A, **The Rise of the Pod Mod:** Trends in E-Cigarette Sales in the US, 2013-2017. Paper presented at: 25th Annual Meeting of SRNT; February 2019; San Francisco, CA.

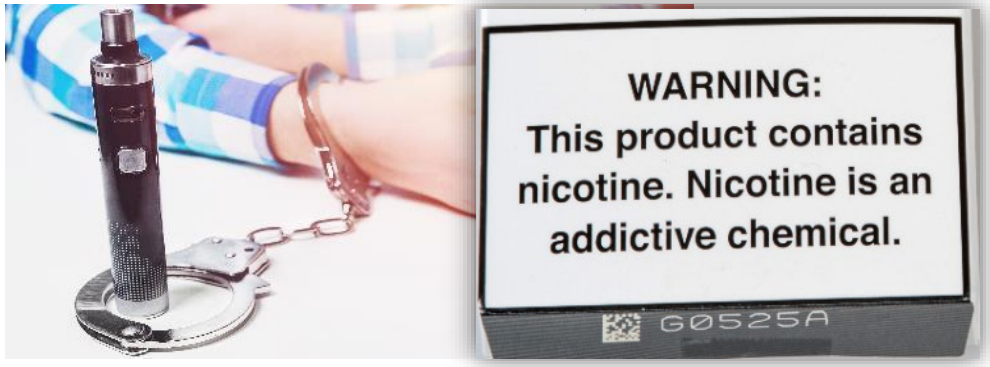
1

## What's an E-cigarette?

2

## Who's Using Them?

3



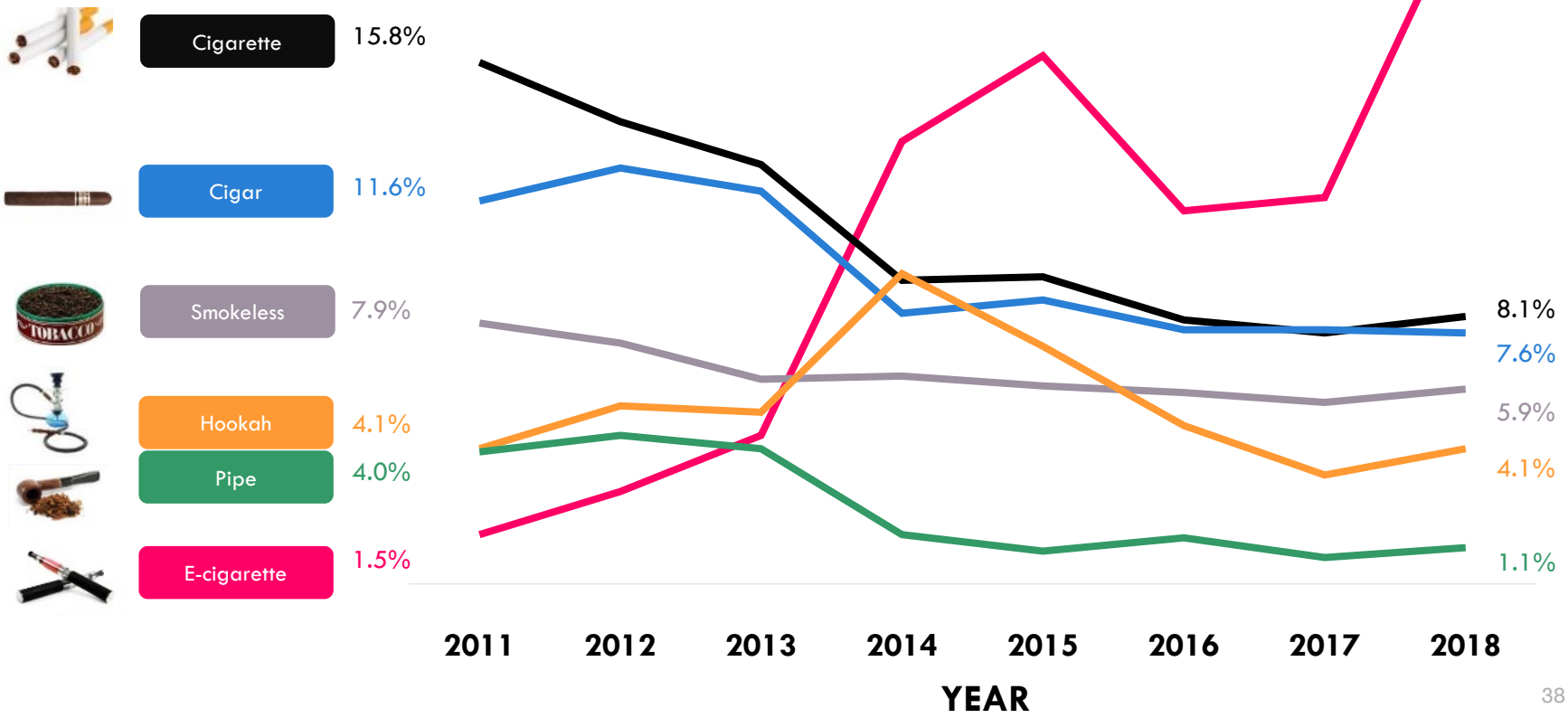

## What Are The Health Effects?

4

## What Can We Do About It?

# CURRENT TOBACCO PRODUCT USE AMONG U.S. HIGH SCHOOL STUDENTS – NYTS (2011–2018)

JUUL Market Share rose to over 75% in 2019

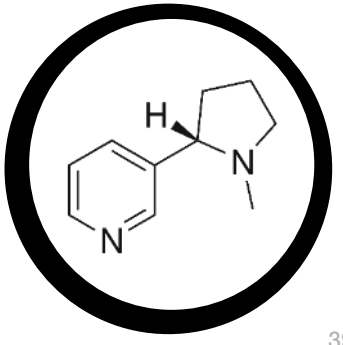




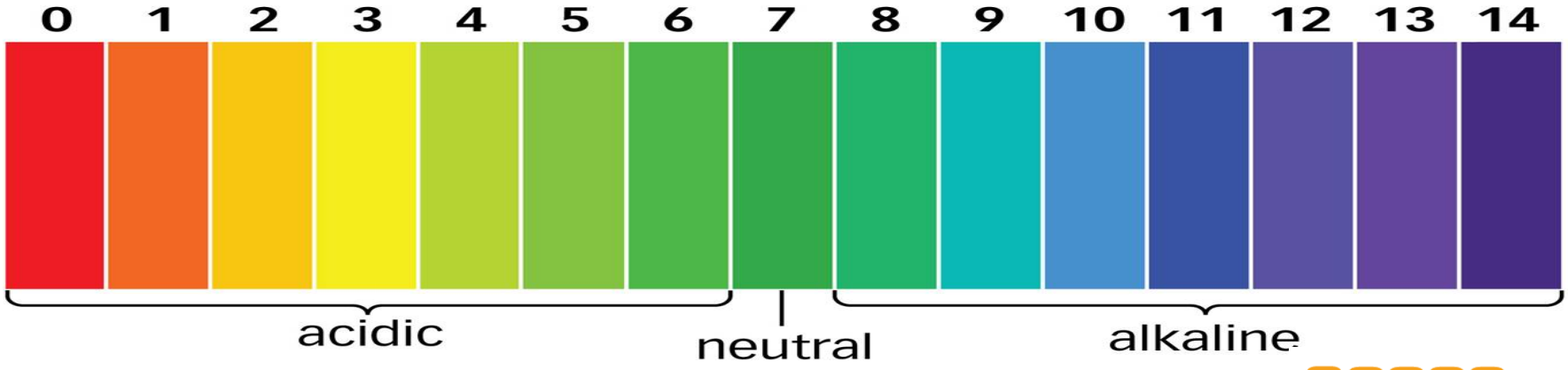

**Source:** Gentzke AS et al. Vital Signs: Tobacco Product Use Among Middle and High School Students — United States, 2011–2018. MMWR Morb Mortal Wkly Rep 2019; 68(6):1-8.

# WHAT CAUSES YOUTH E-CIGARETTE USE

**Advertising** **Flavors** **Nicotine**

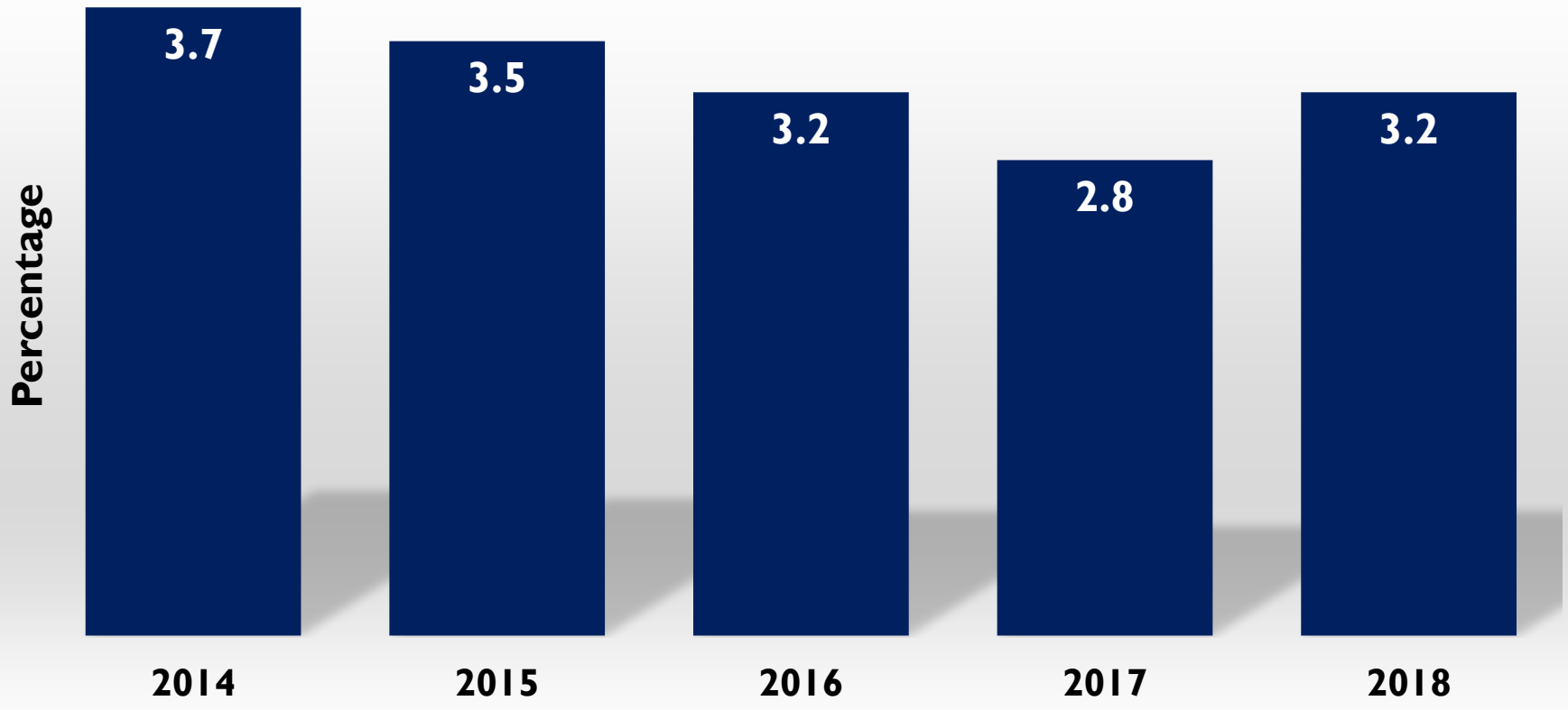


# NICOTINE SALTS ALLOW HIGH LEVELS OF NICOTINE TO BE INHALED MORE EASILY






# CURRENT E-CIGARETTE USE AMONG U.S. ADULTS, 2014–2018






**Source:** National Health Interview Survey 2014-2018

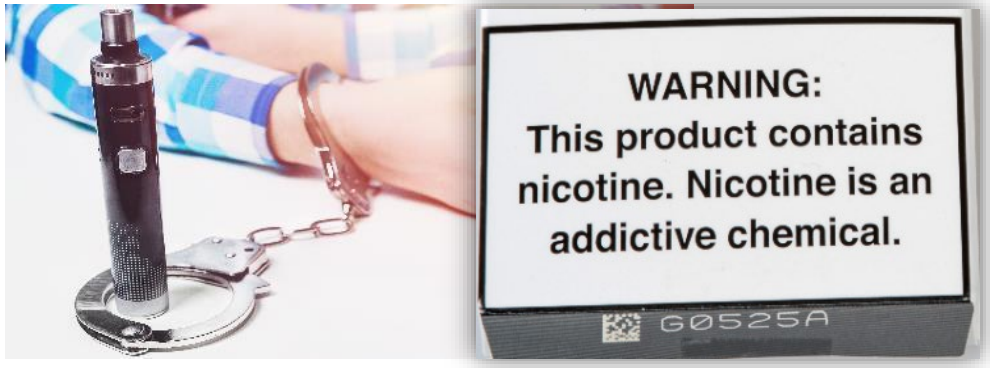
1

## What's an E-cigarette?

2

## Who's Using Them?

3




## What Are The Health Effects?

4

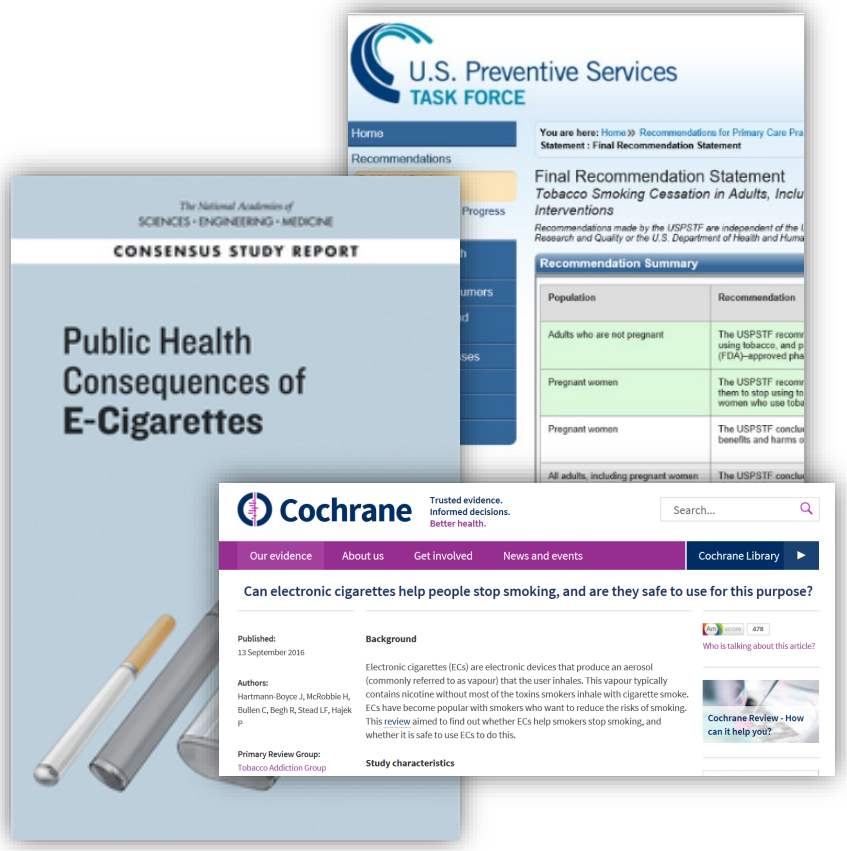
## What Can We Do About It?

# PUBLIC HEALTH BENEFIT OR HARM?

**Youth Initiation**

**Adult Cessation**

# E-CIGARETTE USE AS A SMOKING CESSATION TOOL AMONG ADULTS

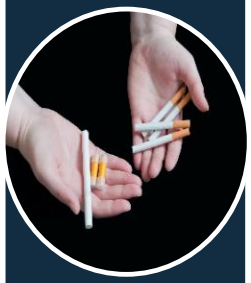



"The long-term safety of e-cigarettes is unknown."

"Overall, the USPSTF found the evidence on the use of ENDS as a smoking cessation tool in adults, including pregnant women, and adolescents to be insufficient."

Conclusion 17-1. Overall, there is limited evidence that e-cigarettes may be effective aids to promote smoking cessation.

# POTENTIAL HEALTH RISKS OF E-CIGARETTES



Leads to initiation of combustible tobacco use among non-smokers, particularly children.

Leads to relapse among former smokers.

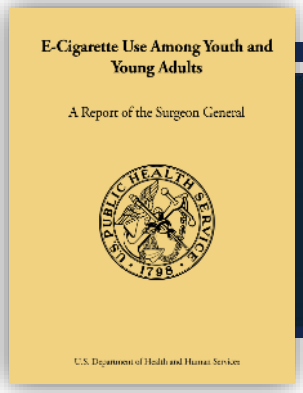
Diminishes the chances that a smoker will quit.

Discourages smokers from using proven quit methods.

Exposes non-users to secondhand aerosol.

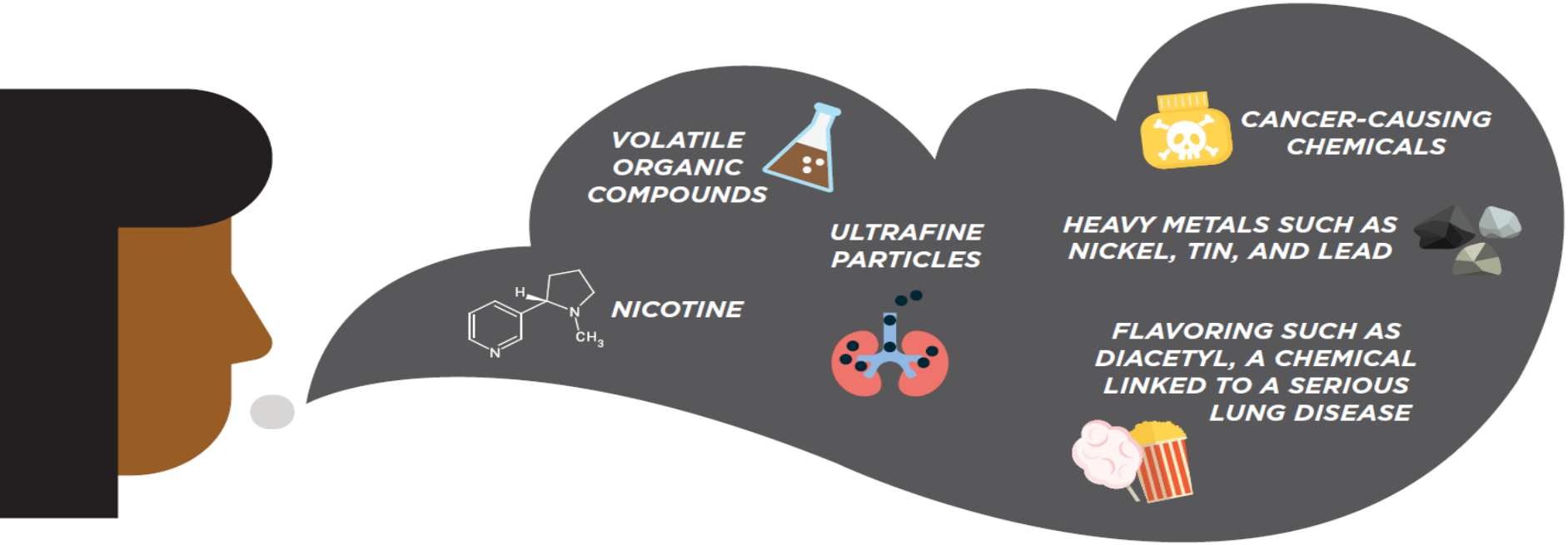
Glamorizes or renormalizes tobacco use.


Results in poisonings among users or non-users.

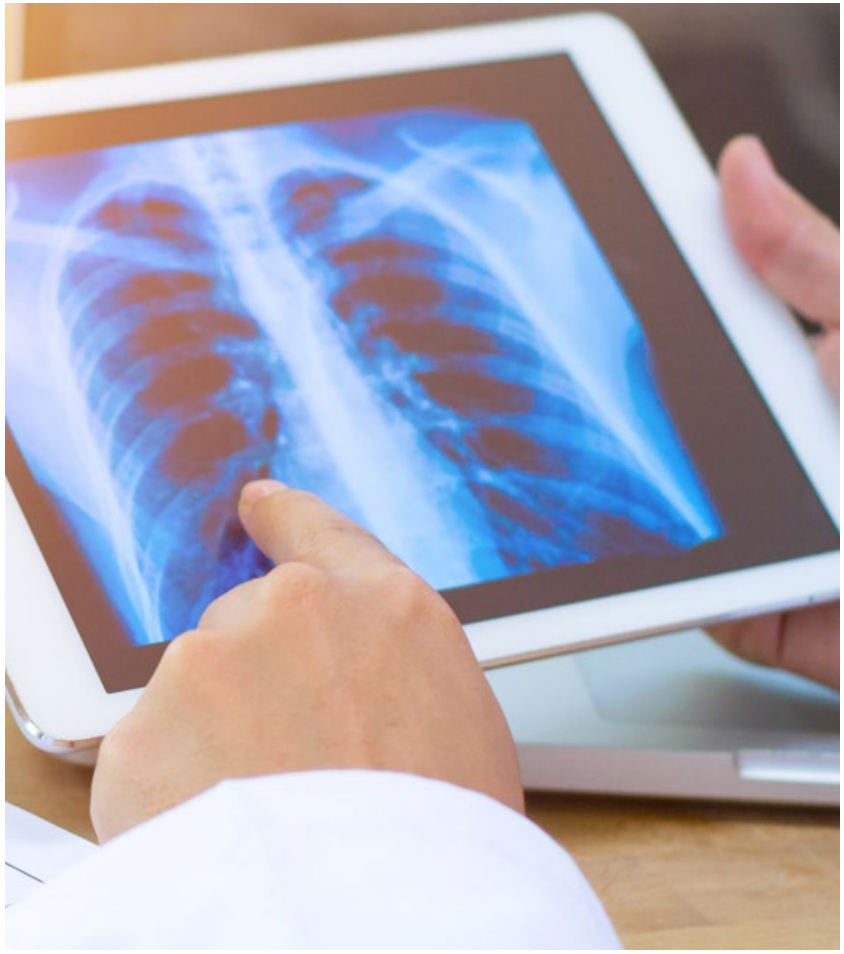



# E-CIGARETTES MAKE AEROSOL, NOT VAPOR

THE E-CIGARETTE AEROSOL THAT USERS BREATHE FROM THE DEVICE AND EXHALE CAN CONTAIN HARMFUL AND POTENTIALLY HARMFUL SUBSTANCES:



# LUNG INJURY ASSOCIATED WITH THE USE OF E-CIGARETTE, OR VAPING, PRODUCTS



- **1,299** lung injury cases associated with the use of e-cigarette, or vaping, products reported
  - All states reported cases except Alaska
- 26 deaths confirmed in 21 states
- All patients have reported a history of using e-cigarette, or vaping, products

# RECOMMENDATIONS FOR THE PUBLIC

- CDC recommends people should:
  - **Not** use e-cigarette, or vaping, products that contain THC
  - **Not** buy these products off the street
  - **Not** modify or add any substance to these products

- At present, CDC recommends people consider refraining from using e-cigarette, or vaping, products that contain nicotine

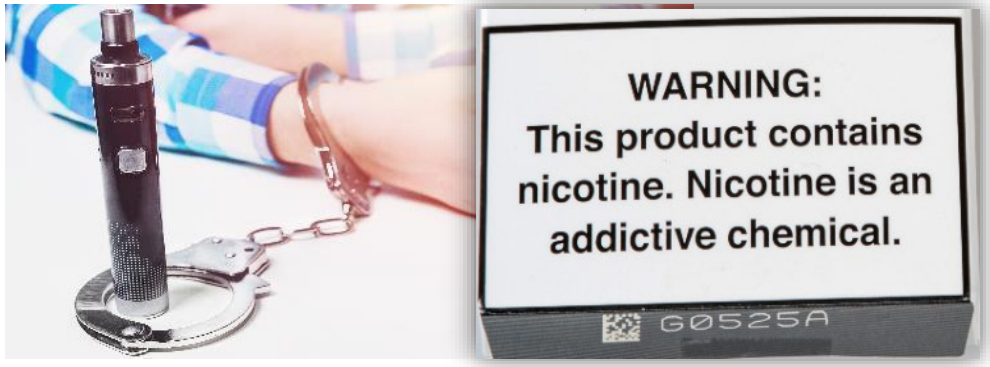
1

## What's an E-cigarette?

2

## Who's Using Them?

3

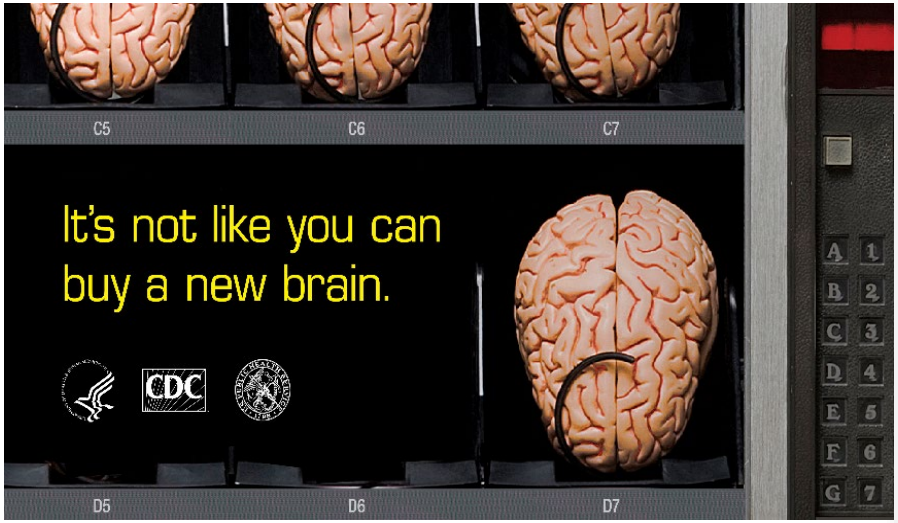



## What Are The Health Effects?

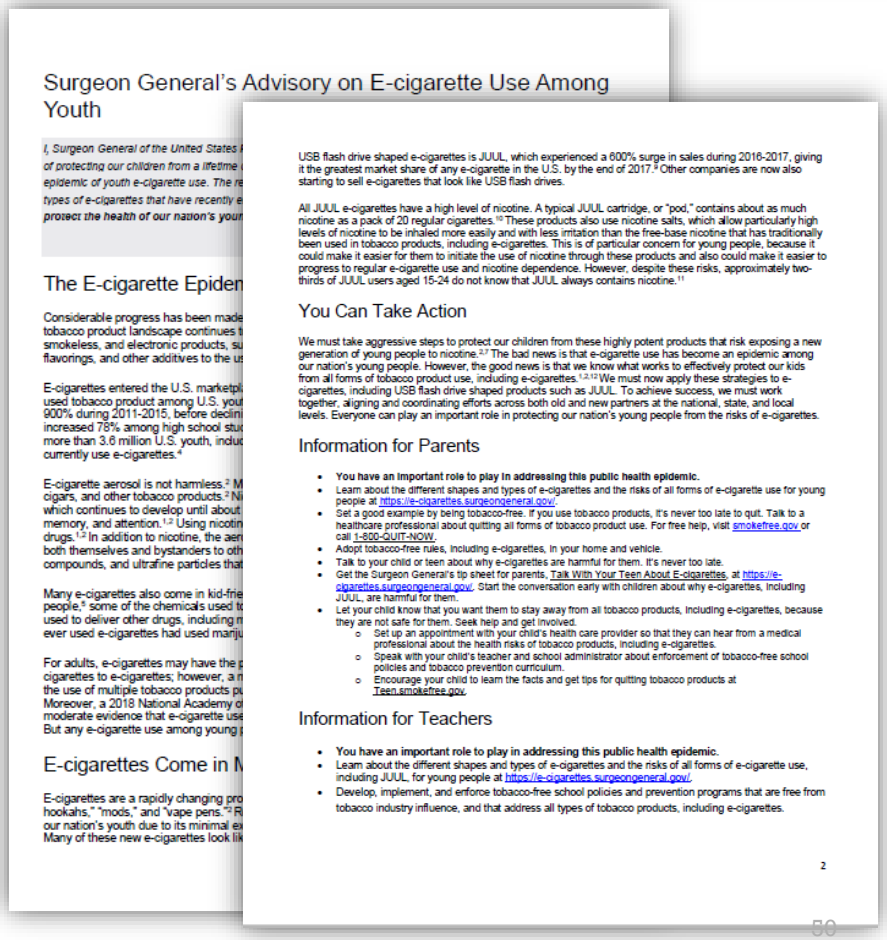
4

## What Can We Do About It?

# SURGEON GENERAL'S ADVISORY ON E-CIGARETTE USE AMONG YOUTH (2018)




https://e-cigarettes.surgeongeneral.gov



Surgeon General's Advisory on E-cigarette Use Among Youth

*I, Surgeon General of the United States*
*of protecting our children from a lifetime*
*epidemic of youth e-cigarette use. The re*
*types of e-cigarettes that have recently e*
***protect the health of our nation's your***

The E-cigarette Epiden

Considerable progress has been made
tobacco product landscape continues t
smokeless, and electronic products, su
flavorings, and other additives to the us

E-cigarettes entered the U.S. marketpl
used tobacco product among U.S. you
900% during 2011-2015, before declini
increased 78% among high school stu
more than 3.6 million U.S. youth, induc
currently use e-cigarettes.[4]

E-cigarette aerosol is not harmless.[2] M
cigars, and other tobacco products.[2] Ni
which continues to develop until about
memory, and attention.[1,2] Using nicotin
drugs.[1,2] In addition to nicotine, the aer
both themselves and bystanders to oth
compounds, and ultrafine particles that

Many e-cigarettes also come in kid-frie
people,[5] some of the chemicals used t
used to deliver other drugs, including m
ever used e-cigarettes had used marju

For adults, e-cigarettes may have the p
cigarettes to e-cigarettes; however, a m
the use of multiple tobacco products pi
Moreover, a 2018 National Academy o
moderate evidence that e-cigarette use
But any e-cigarette use among young p

E-cigarettes Come in M

E-cigarettes are a rapidly changing pro
hookahs," "mods," and "vape pens."[6] R
our nation's youth due to its minimal e
Many of these new e-cigarettes look lik

USB flash drive shaped e-cigarettes is JUUL, which experienced a 600% surge in sales during 2016-2017, giving it the greatest market share of any e-cigarette in the U.S. by the end of 2017.[9] Other companies are now also starting to sell e-cigarettes that look like USB flash drives.

All JUUL e-cigarettes have a high level of nicotine. A typical JUUL cartridge, or "pod," contains about as much nicotine as a pack of 20 regular cigarettes.[10] These products also use nicotine salts, which allow particularly high levels of nicotine to be inhaled more easily and with less irritation than the free-base nicotine that has traditionally been used in tobacco products, including e-cigarettes. This is of particular concern for young people, because it could make it easier for them to initiate the use of nicotine through these products and also could make it easier to progress to regular e-cigarette use and nicotine dependence. However, despite these risks, approximately two-thirds of JUUL users aged 15-24 do not know that JUUL always contains nicotine.[11]

## You Can Take Action

We must take aggressive steps to protect our children from these highly potent products that risk exposing a new generation of young people to nicotine.[2,7] The bad news is that e-cigarette use has become an epidemic among our nation's young people. However, the good news is that we know what works to effectively protect our kids from all forms of tobacco product use, including e-cigarettes.[1,2,12] We must now apply these strategies to e-cigarettes, including USB flash drive shaped products such as JUUL. To achieve success, we must work together, aligning and coordinating efforts across both old and new partners at the national, state, and local levels. Everyone can play an important role in protecting our nation's young people from the risks of e-cigarettes.

## Information for Parents

- **You have an important role to play in addressing this public health epidemic.**
- Learn about the different shapes and types of e-cigarettes and the risks of all forms of e-cigarette use for young people at https://e-cigarettes.surgeongeneral.gov/.
- Set a good example by being tobacco-free. If you use tobacco products, it's never too late to quit. Talk to a healthcare professional about quitting all forms of tobacco product use. For free help, visit smokefree.gov or call 1-800-QUIT-NOW.
- Adopt tobacco-free rules, including e-cigarettes, in your home and vehicle.
- Talk to your child or teen about why e-cigarettes are harmful for them. It's never too late.
- Get the Surgeon General's tip sheet for parents, Talk With Your Teen About E-cigarettes, at https://e-cigarettes.surgeongeneral.gov/. Start the conversation early with children about why e-cigarettes, including JUUL, are harmful for them.
- Let your child know that you want them to stay away from all tobacco products, including e-cigarettes, because they are not safe for them. Seek help and get involved.
  - Set up an appointment with your child's health care provider so that they can hear from a medical professional about the health risks of tobacco products, including e-cigarettes.
  - Speak with your child's teacher and school administrator about enforcement of tobacco-free school policies and tobacco prevention curriculum.
  - Encourage your child to learn the facts and get tips for quitting tobacco products at Teen.smokefree.gov.

## Information for Teachers

- **You have an important role to play in addressing this public health epidemic.**
- Learn about the different shapes and types of e-cigarettes and the risks of all forms of e-cigarette use, including JUUL, for young people at https://e-cigarettes.surgeongeneral.gov/.
- Develop, implement, and enforce tobacco-free school policies and prevention programs that are free from tobacco industry influence, and that address all types of tobacco products, including e-cigarettes.

2

# EVERYONE HAS A ROLE IN ADDRESSING YOUTH E-CIGARETTE USE

States, communities, tribes, and territories

Parents

Teachers

Health Professionals

- Implement evidence-based population-level strategies to reduce e-cigarette use among young people, such as including e-cigarettes in smoke-free indoor air policies, restricting young peoples' access to e-cigarettes in retail settings, licensing retailers, implementing price policies, and developing educational initiatives targeting young people.
- Implement strategies to curb e-cigarette advertising and marketing that are appealing to young people.
- Implement strategies to reduce access to flavored tobacco products by young people.

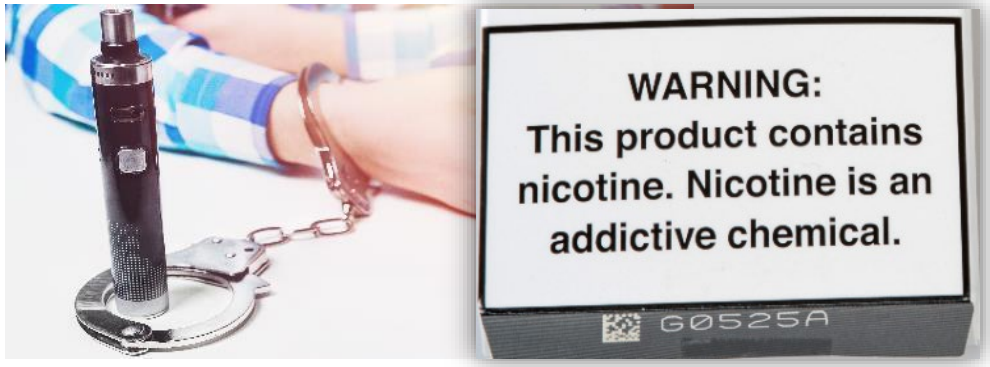
1

E-cigarettes are a tobacco product that produces an aerosol by heating a liquid that typically contains nicotine, flavorings, and other chemicals.

2

Several factors have contributed to youth use, including advertising, flavors, and high nicotine content.

3




Youth use of e-cigarettes is unsafe. Adult smokers must completely quit to realize benefits from e-cigarettes.

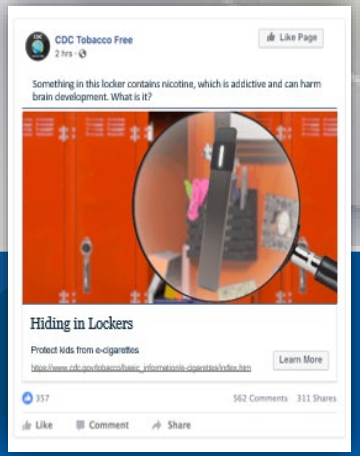
4

As the tobacco product landscape continues to diversify, it's important to modernize tobacco control strategies to adapt.

**Brian A. King, PhD, MPH**
**Office on Smoking and Health**
**baking@cdc.gov**

www.cdc.gov/tobacco





# E-cigarettes, Vaping and Smokefree Indoor Air Policies in Public and Private Spaces: Trends, Challenges, Opportunities

Cynthia Hallett, M.P.H.

President and CEO

AMERICAN NONSMOKERS' RIGHTS FOUNDATION

@ANR_Smokefree

www.no-smoke.org

# From Sections to smokefree

- 1970s/1980s = Nonsmoking Sections
- 1990s = Clean Indoor Air Policies
  - Separately enclosed, separately ventilated rooms were acceptable
- 2000 = 100 Percent Smokefree Indoor Environments
  - No separation, ventilation, exemptions for small businesses or private clubs
- 2010 = Expanding smokefree into other workplaces (casinos and colleges) and including other tobacco products (e-cigarettes)

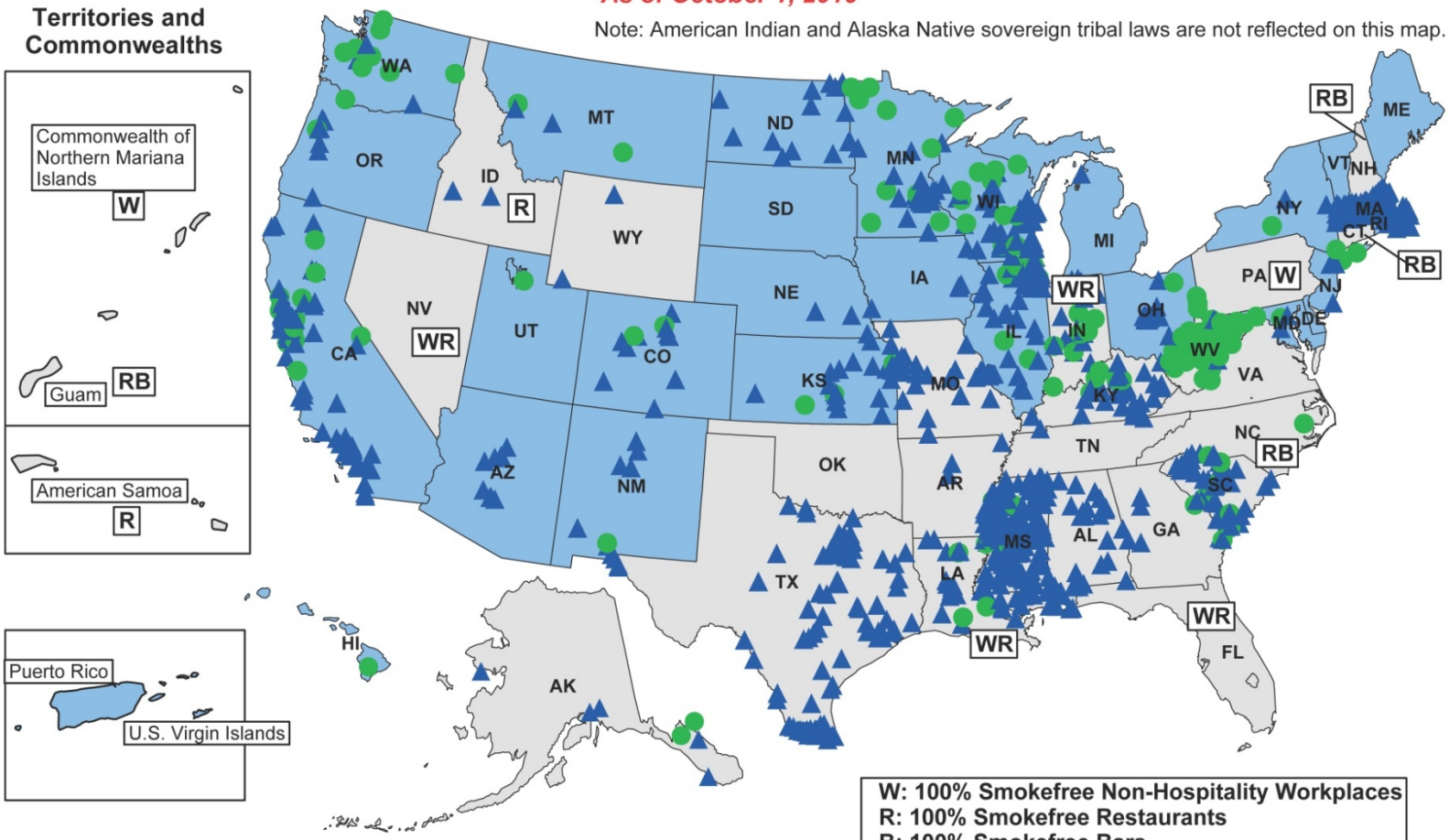
*These shifts toward stronger provisions were supported by a combination of public demand and the science on the health effects of secondhand smoke.*

# U.S. 100% Smokefree Laws in Non-Hospitality Workplaces AND Restaurants AND Bars

## American Nonsmokers' Rights Foundation

*As of October 1, 2019*

Note: American Indian and Alaska Native sovereign tribal laws are not reflected on this map.




[LS-36]

# Perception: The Job Is Done!

# Reality: Significant Gaps, Emerging Products, and Persistent Opposition From Industry


# Bridging the Gap: Status of Smokefree Air in the United States

## Too many Americans are falling through gaps in protections from secondhand smoke

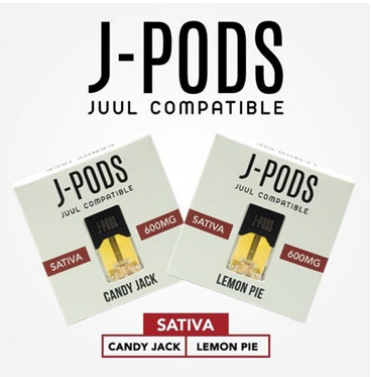

ANRF American Nonsmokers' Rights Foundation

www.no-smoke.org/gaps

# Smokefree Whack-A-Mole:
# Addressing E-cigarettes and Marijuana

# Triangulum: Tobacco, E-cigarettes, and Marijuana

Tobacco use among adults and youth is on the decline; however, use of electronic smoking devices, including JUUL, and that co-use of combustible marijuana and tobacco is on the rise. One strategy to reduce use is to include e-cigarettes and marijuana in smokefree laws.

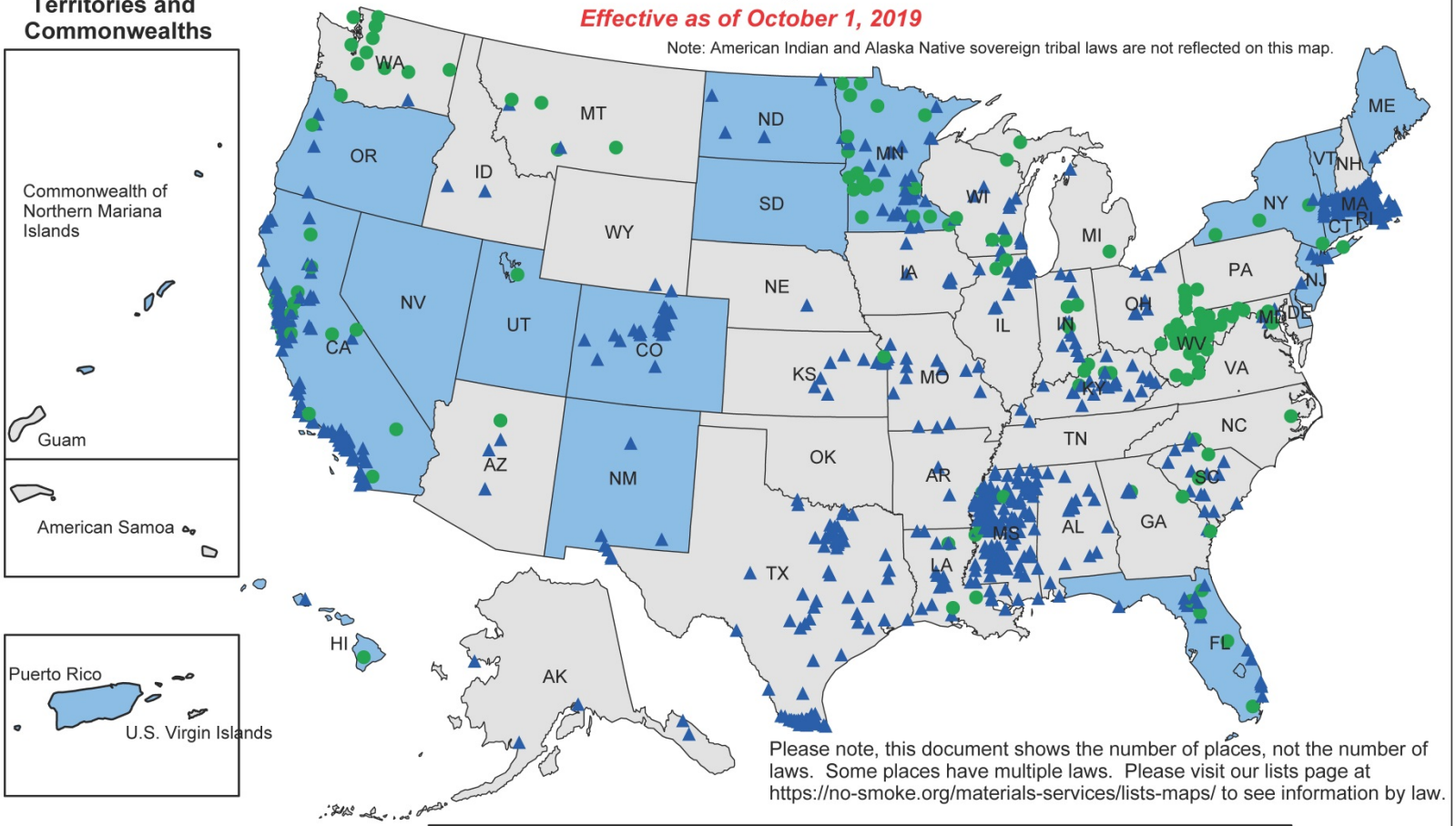



# States & Municipalities with Laws Regulating Use of Electronic Cigarettes in 100% Smokefree Venues

## American Nonsmokers' Rights Foundation

***Effective as of October 1, 2019***

Note: American Indian and Alaska Native sovereign tribal laws are not reflected on this map.




Please note, this document shows the number of places, not the number of laws. Some places have multiple laws. Please visit our lists page at https://no-smoke.org/materials-services/lists-maps/ to see information by law.

**Locality Type**

- City
- County

**State and Commonwealth/Territory Law Type**

- Law Restricts E-cigarette Use in 100% Smokefree Venues
- No E-cigarette Restriction in 100% Smokefree Venues

[LS-45]

# Benefits of including e-cigarettes in smokefree laws

- Prevents exposure to the particulate matter, toxins, and volatile organic compounds
- Reduces social cues to smoke or vape
- Increases social norms for tobacco-free living
- May prevent initiation of vaping and increases perception of risk
  - New study: “Associations between public e-cigarette use and tobacco-related social norms among youth”
    https://tobaccocontrol.bmj.com/content/early/2019/05/13/tobaccocontrol-2018-054728

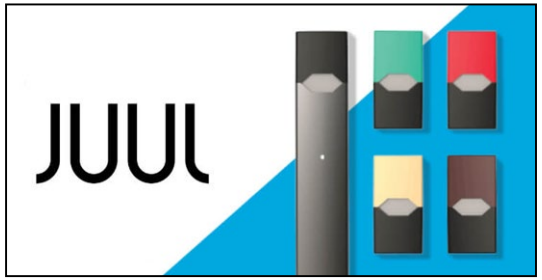
SHA exposure in public places was associated with increased susceptibility to using e-cigarettes and cigarettes; e-cigarette harm perception was lower among students in jurisdictions with no comprehensive clean indoor air laws or cigarette-only laws than in those prohibiting both cigarette and e-cigarette use in public places.

# The Vaping Epidemic

"Teen vaping is reaching **epidemic levels** and FDA is considering **regulation** to curb it. One proposal would be banning flavoring of e-cigarette liquids."

*-USA TODAY, September 18, 2018*

Image: healthline.com




**63 percent** of young JUUL users don't know it **always** contains nicotine.


Image: CA Tobacco Control Program, flavorshookkids.org

# Secondhand Marijuana Smoke

- **12 states** have legalized recreational marijuana use
- Marijuana smoke contains many of the same **cancer-causing substances** and **toxic chemicals** as secondhand tobacco smoke.
- Contains **fine particulate matter** that poses health risks:
  - It's breathed deeply into our lungs.
  - It causes lung irritation, asthma attacks, and respiratory infection.
  - It worsens respiratory conditions like asthma, bronchitis, and COPD.
  - Surgeon General's 8/29/19 warning

# Smoke Is Smoke

"**Smoke is smoke.** Both tobacco and marijuana smoke impair blood vessel function similarly. People should avoid both, and governments who are protecting people against secondhand smoke exposure should include marijuana in those rules."

Matthew L. Springer, Ph.D.
Professor of Medicine
Cardiovascular Research Institute
Center for Tobacco Control Research & Education
University of California, San Francisco

# Public Health Challenges Associated With Legalized Marijuana

- Legalization is increasing **exposure** to secondhand marijuana smoke.
- Marijuana should not be used in ways that **harm** others.

- Smokefree spaces should be free of **all types** of smoke and secondhand aerosol.
- People should not have to **breathe** secondhand marijuana smoke where they work, live, and play.

THOUGHT EXPERIMENT

# Secondhand marijuana smoke is not just a growing nuisance, it's dangerous

There's no indication that in agreeing to legalize marijuana, voters intended to give a green light to widespread public smoking.

Smoking marijuana is becoming increasingly widespread in public places. Tunatura / Getty Images/iStockphoto

May 20, 2019, 1:49 AM PDT

**By Cynthia Hallett, president and CEO of Americans for Nonsmokers' Rights**

"Mind if I smoke?" is an old refrain from the days when smoking was a ubiquitous habit and people frequently puffed on cigarettes in offices, on airplanes and at restaurants. Big Tobacco pushed the idea that "common courtesy" was enough to protect nonsmokers from toxic secondhand smoke, and that smoke-free laws were unnecessary.

https://nbcnews.com/think/opinion/secondhand-marijuana-smoke-not-just-growing-nuisance-it-s-dangerous-ncna1007161

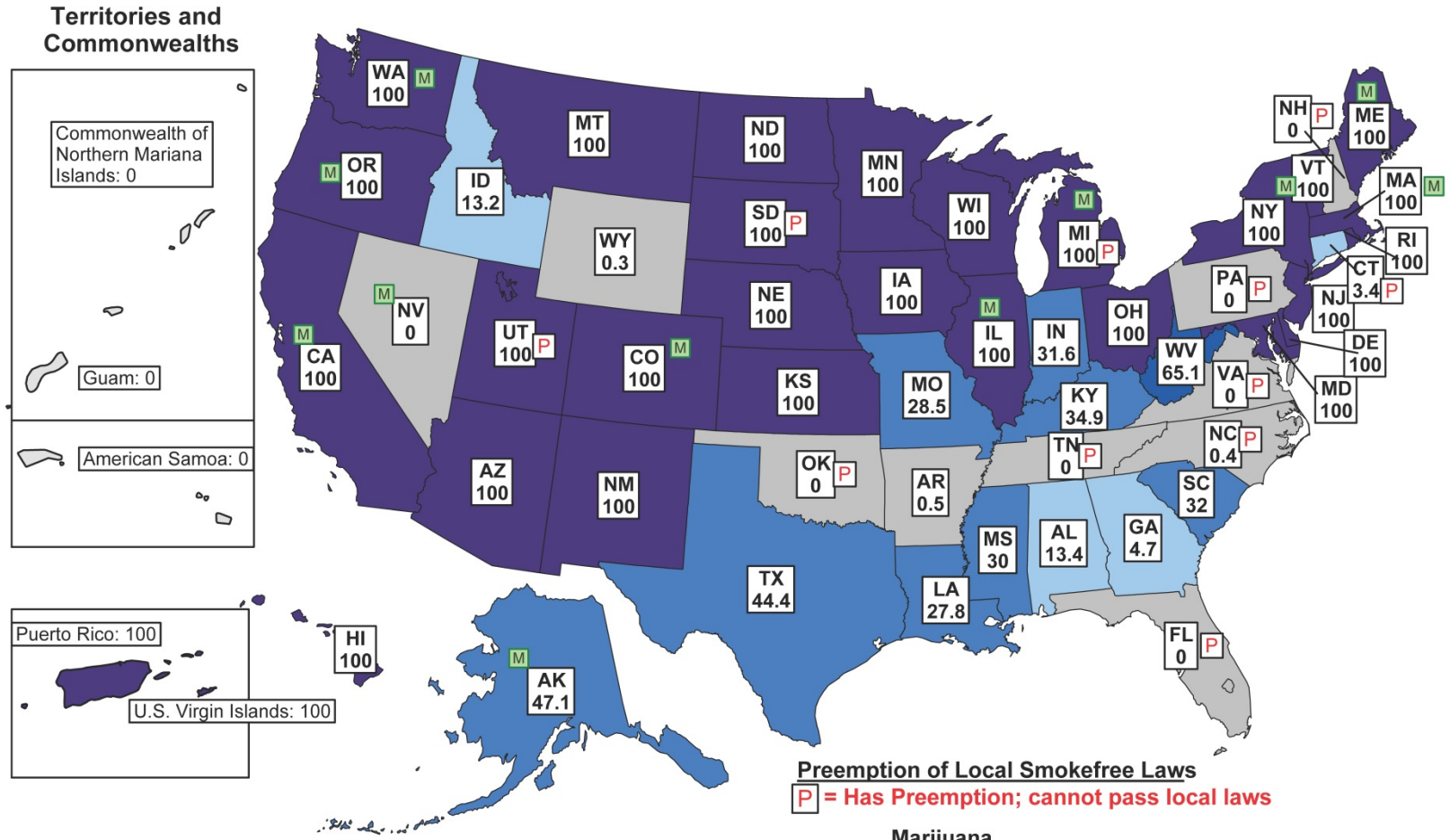
# State and Local Laws Prohibiting Smoking AND Vaping Marijuana

## American Nonsmokers' Rights Foundation


**Recreational Marijuana Legalized**

# Percent of Population Covered by 100% Smokefree Non-Hospitality Workplace, Restaurant, and Bar Laws In Effect As of October 1, 2019

American Nonsmokers' Rights Foundation, www.no-smoke.org




Note: American Indian and Alaska Native sovereign tribal laws are not reflected on this map.

**61% of the U.S. is protected by a 100% workplace, restaurant, and bar law.**

**State/Commonwealth/Territory Population with 100% Smokefree Workplace, Restaurant, and Bar Laws**

<1% | 1-25% | 26-50% | 51-75% | 76-99% | 100%

# Ventilation is NOT a solution to control for secondhand smoke or secondhand aerosol.

***"At a minimum, establish and maintain smoke-free workplaces that protect those in workplaces from secondhand exposures to tobacco smoke and airborne emissions from e-cigarettes and other electronic nicotine delivery systems.*** *Smoke-free zones should encompass (1) all indoor areas without exceptions (i.e., no indoor smoking areas of any kind, even if separately enclosed and/or ventilated), (2) all areas immediately outside building entrances and air intakes, and (3) all work vehicles. Additionally, ashtrays should be removed from these areas."*



**Addendum c to Standard 62.1-2013**

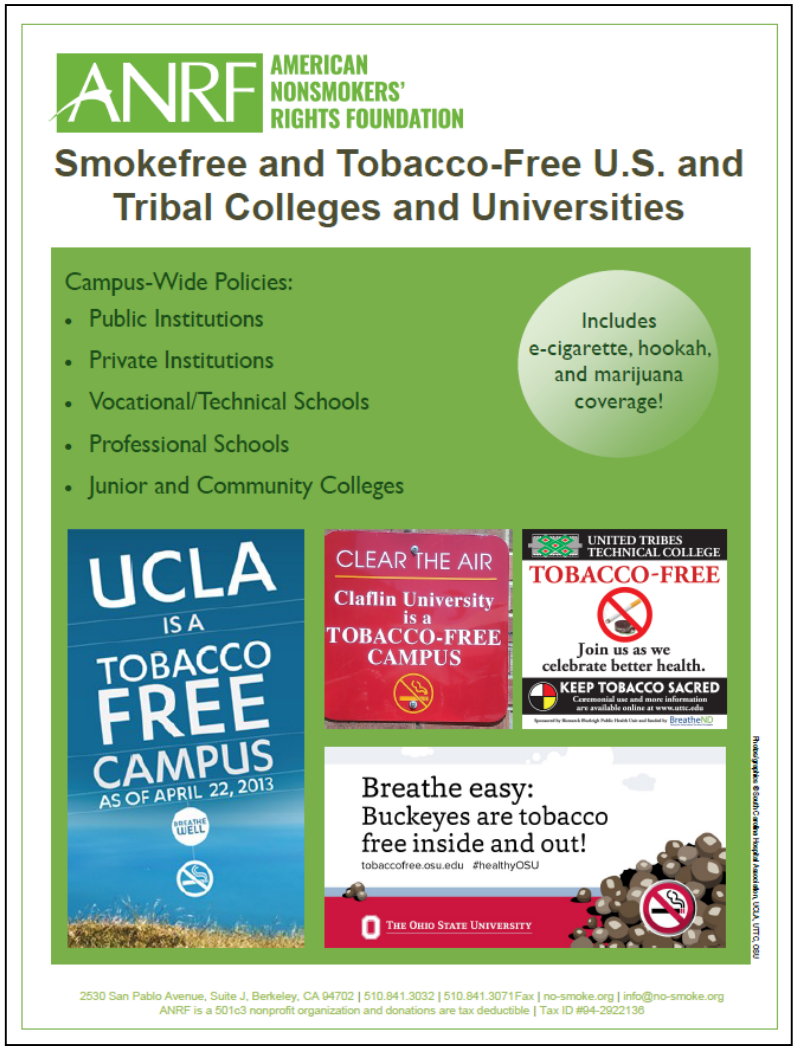
***Modify Section 3 as follows.***

***environmental tobacco smoke (ETS):*** the "aged" and diluted combination of both side-stream smoke (smoke from the lit end of a cigarette or other tobacco product) and exhaled mainstream smoke (smoke that is exhaled by a smoker). ETS is commonly referred to as *secondhand smoke*. This definition includes smoke produced from the combustion of cannabis and controlled substances and the emissions produced by electronic smoking devices.

ANRF AMERICAN NONSMOKERS' RIGHTS FOUNDATION

www.no-smoke.org

# College Campus Policy Trends

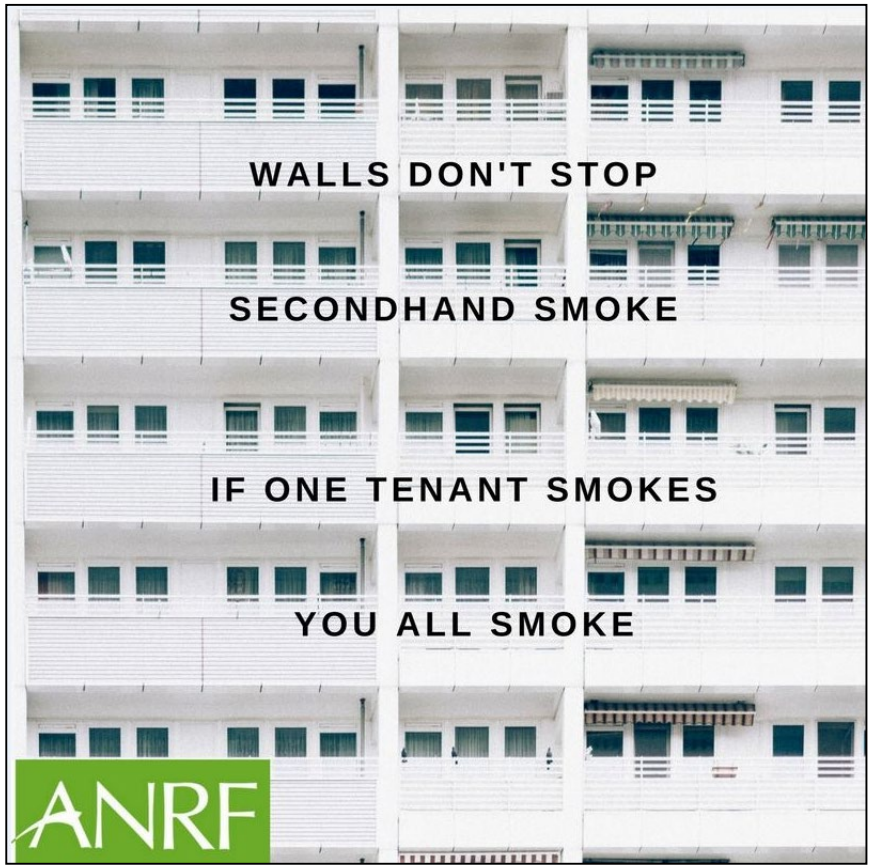



- There are at least **2,469** 100 percent smokefree campus sites.

Of these:

- **2.044** are 100% tobacco-free
- **2,074** prohibit e-cigarette use
- **1,089** prohibit hookah use
- **477** prohibit smoking/vaping marijuana
- **528** explicitly apply to personal vehicles on campus

# Multi-Unit Housing




# *Thank You!*

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www.no-smoke.org
www.smokefreemusiccities.org

Twitter and Facebook: @ANR_Smokefree
@SmokefreeMusic
@SmokefreeCasinos

EPA United States Environmental Protection Agency

CIAQ Federal Interagency Committee on Indoor Air Quality

# Do you have questions for our presenters?

Use the “Questions” function on the right side of your screen.

EPA United States Environmental Protection Agency

CIAQ Federal Interagency Committee on Indoor Air Quality

# Thank you for joining us today.

Written copies of updates and the presentation slides (with permission of the presenters) from this meeting will be available on the CIAQ website in the coming weeks:
www.epa.gov/indoor-air-quality-iaq/federal-interagency-committee-indoor-air-quality

The next CIAQ meeting is scheduled for February 2020.