



CARDI·OH

Ohio Cardiovascular and Diabetes Health Collaborative



CASE WESTERN RESERVE
UNIVERSITY
School of Medicine

In partnership with:



Cardi-OH ECHO

Health Equity and Cardiovascular Risk

February 15, 2024

About Cardi-OH

Founded in 2017, the mission of Cardi-OH is to improve cardiovascular and diabetes health outcomes and eliminate disparities in Ohio's Medicaid population.

WHO WE ARE: An initiative of health care professionals across Ohio's seven medical schools.

WHAT WE DO: Identify, produce, and disseminate evidence-based cardiovascular and diabetes best practices to primary care teams.

HOW WE DO IT: Best practices resources are available via an online library at Cardi-OH.org, including monthly newsletters, podcasts, webinars, and virtual clinics using the Project ECHO® virtual training model.

[Learn more at Cardi-OH.org](http://Cardi-OH.org)



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Disclosure Statements



- The following speakers and subject matter experts have a relevant financial interest or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of their presentation*:
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* These financial relationships are outside the presented work.

** For more information about exemptions or details, see www.acme.org/standards



Tobacco Use and Environmental Risks

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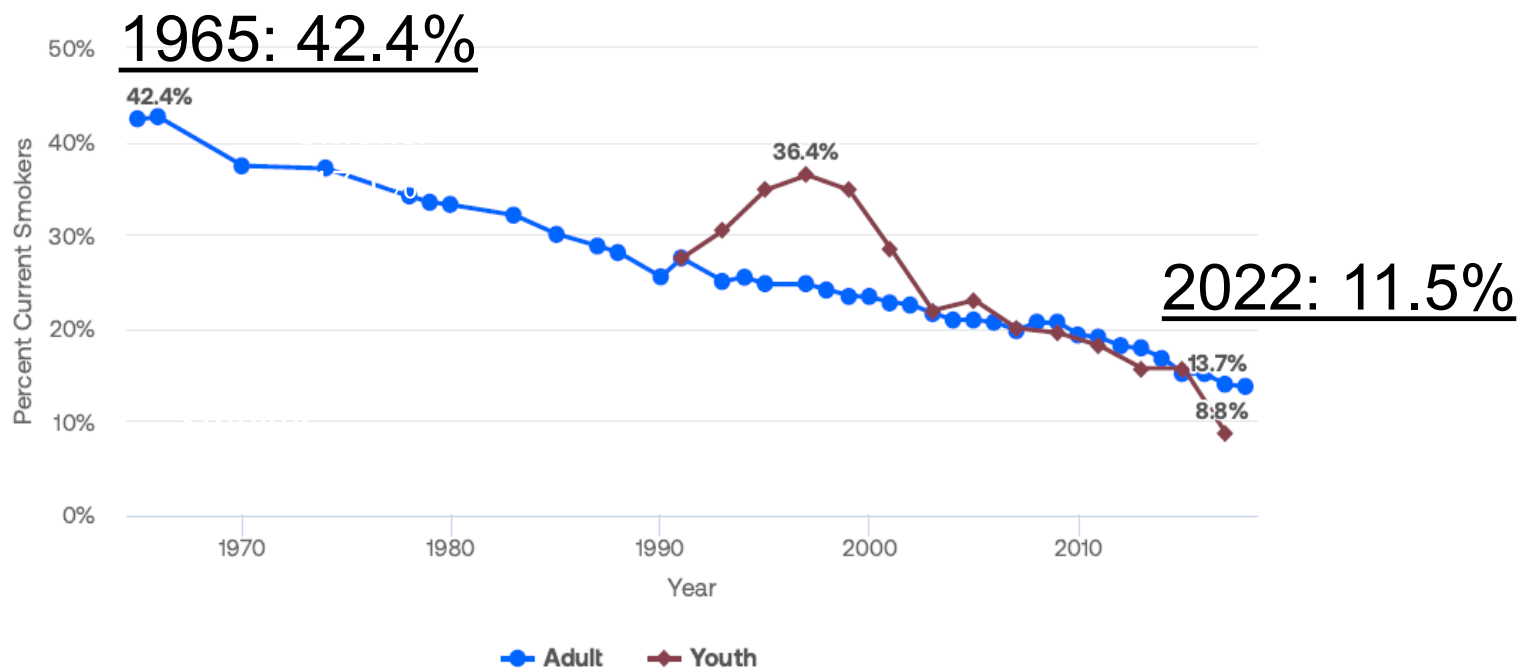
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Learning Objectives



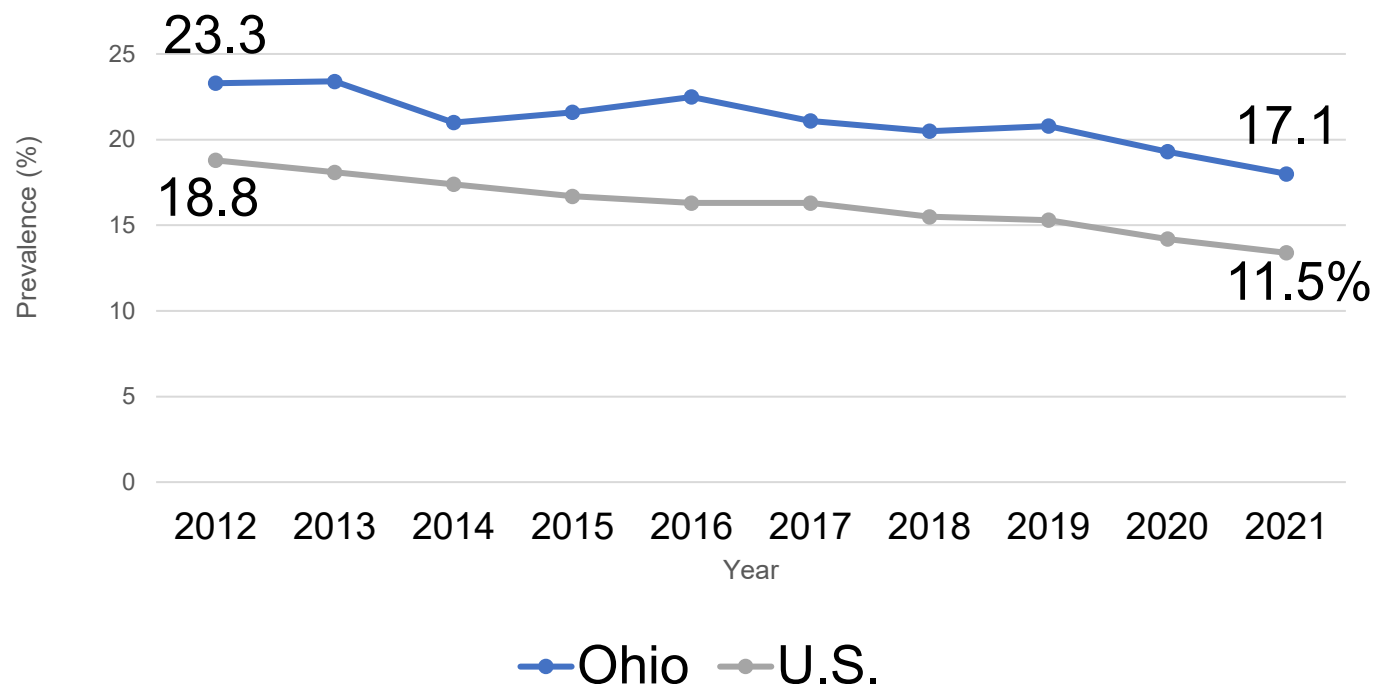
- 1) Describe the prevalence of tobacco use among different subpopulations in the United States.
- 2) Describe culturally sensitive approaches to smoking cessation among different subpopulations in the United States.
- 3) List a minimum of two resources available to assist patient with smoking cessation available throughout Ohio.

Adult Cigarette Smoking Rates in the US



- Mass media anti-smoking campaigns
- Education for children on dangers of smoking
- Restrictions on advertising
- Smoke-free policies
- Better cessation treatments & resources
- Insurance coverage of treatments
- Taxes on tobacco products

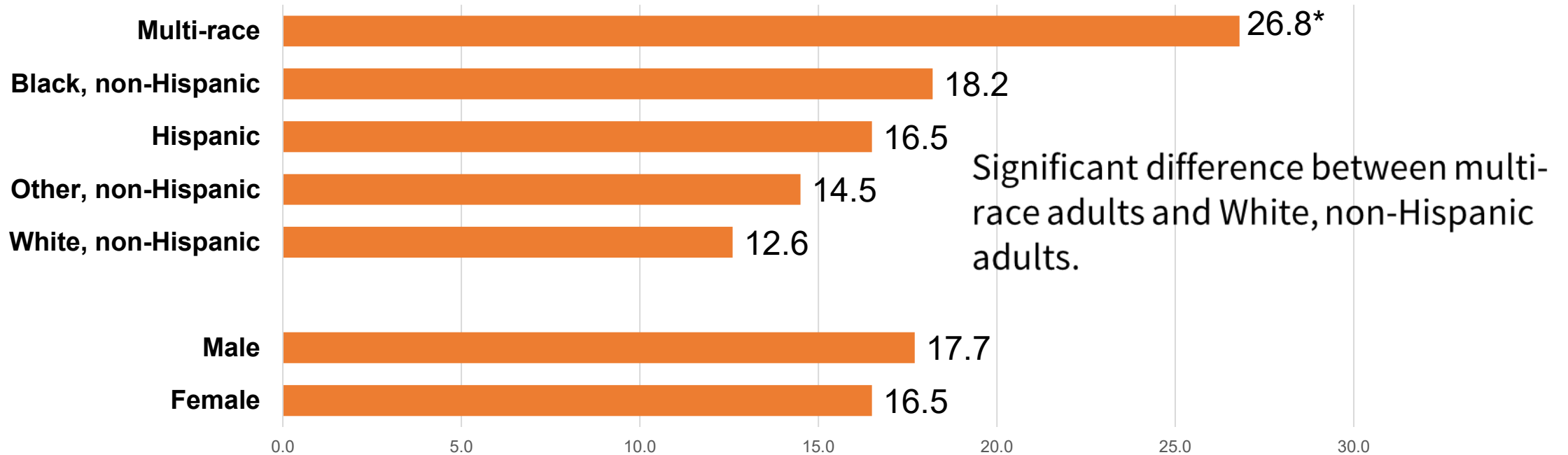
Cigarette Use Among Adults in Ohio & the US, 2012-2022



- Ohio 17.1% vs. 11.5% in the US
- Ohio has the 8th highest rate of among US states
- Borders WV, KY, IN, MI

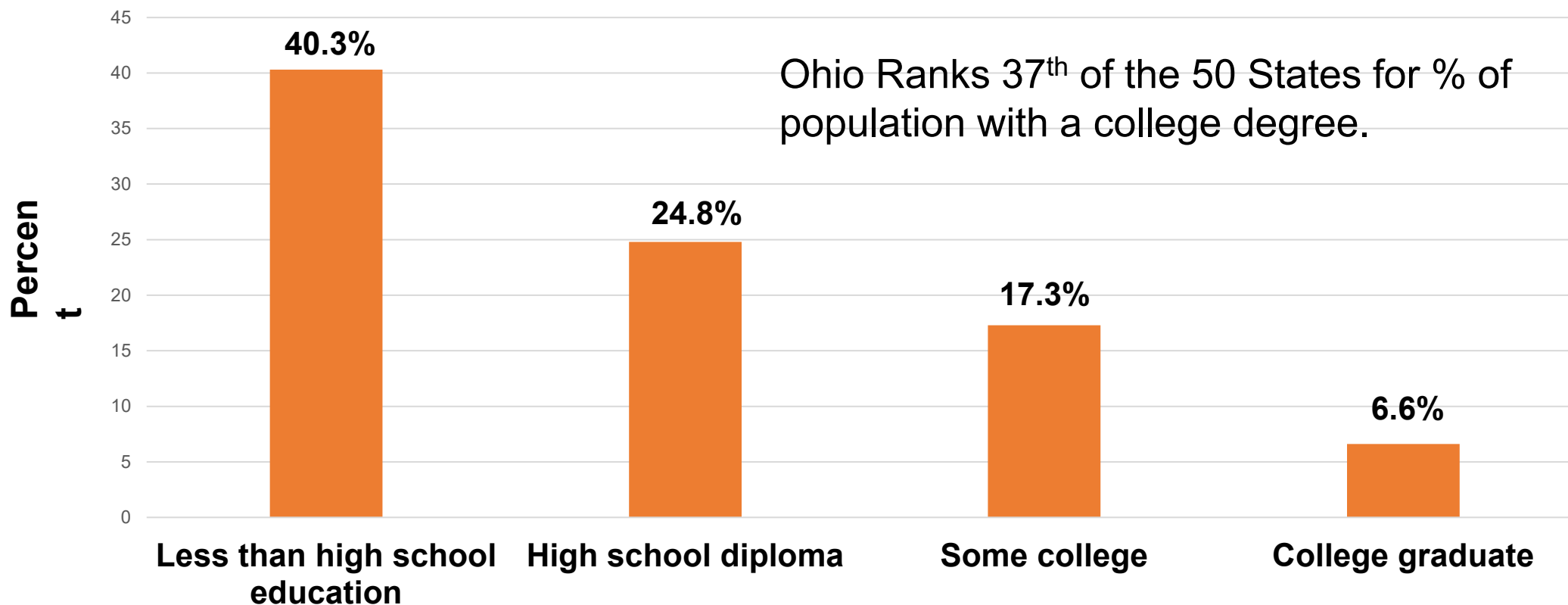
Adapted from Ohio Department of Health. Tobacco Use Among Adults in Ohio, 2021. Ohio Behavioral Risk Factor Surveillance System/ Ohio Tobacco Survey 2021. <https://odh.ohio.gov/know-our-programs/tobacco-use-prevention-and-cessation/media/ats-data-slides-2021>

Current Cigarette Use By Sex, Race & Ethnicity in Ohio Adults, 2022



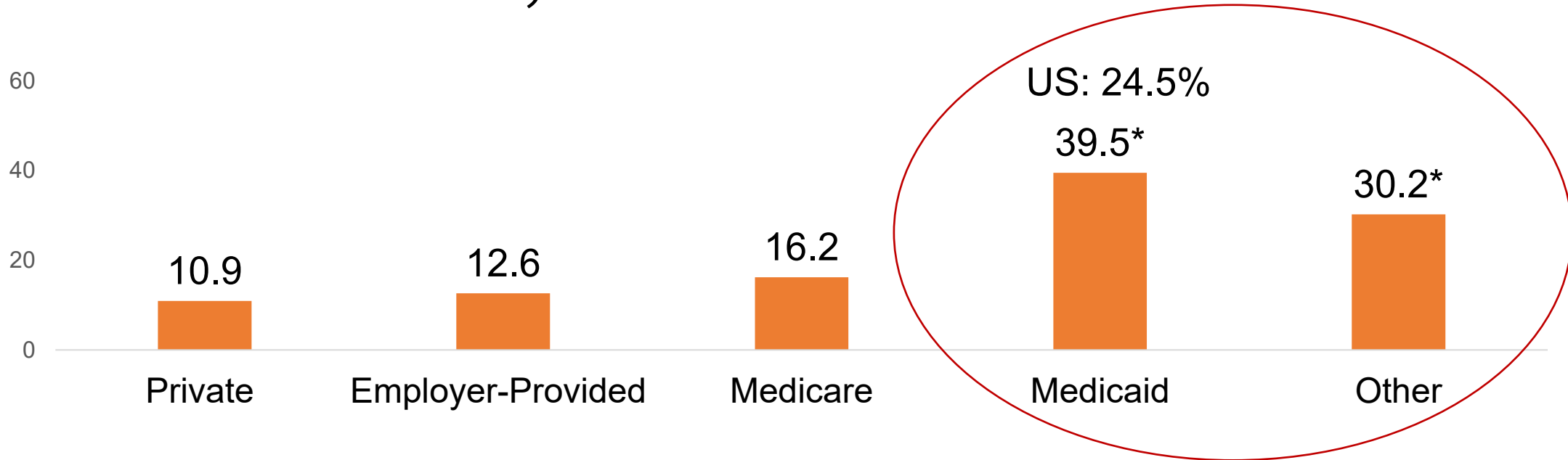
Other races includes Asian, Pacific Islander, American Indian, and Alaskan Native.

Disparities in Adult Smoking Rates by Educational Attainment, Ohio 2021



2021 Ohio Behavioral Risk Factor Surveillance System, Chronic Disease Epidemiology and Evaluation, Ohio Department of Health, 2022.

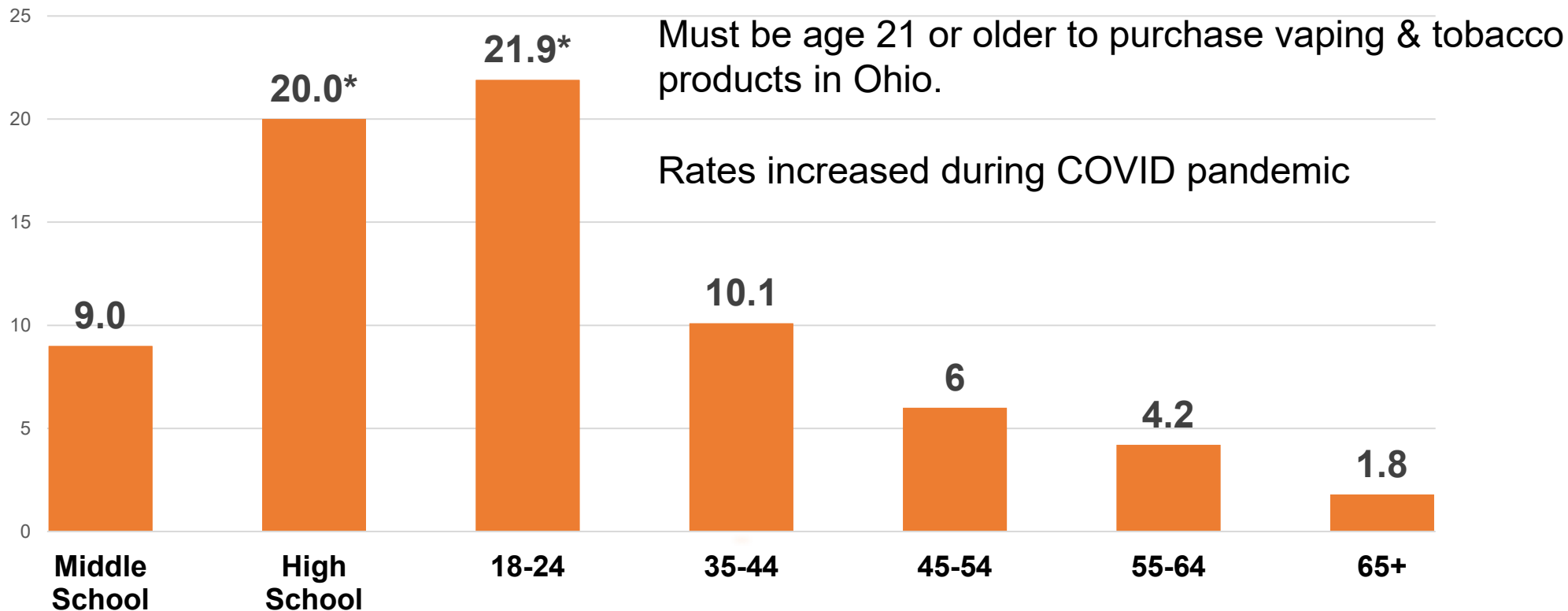
Cigarette Use by Insurance Type Among Adults in Ohio, 2021



Note: Other insurance includes TRICARE, Indian Health Service, state-sponsored programs, and other government programs.

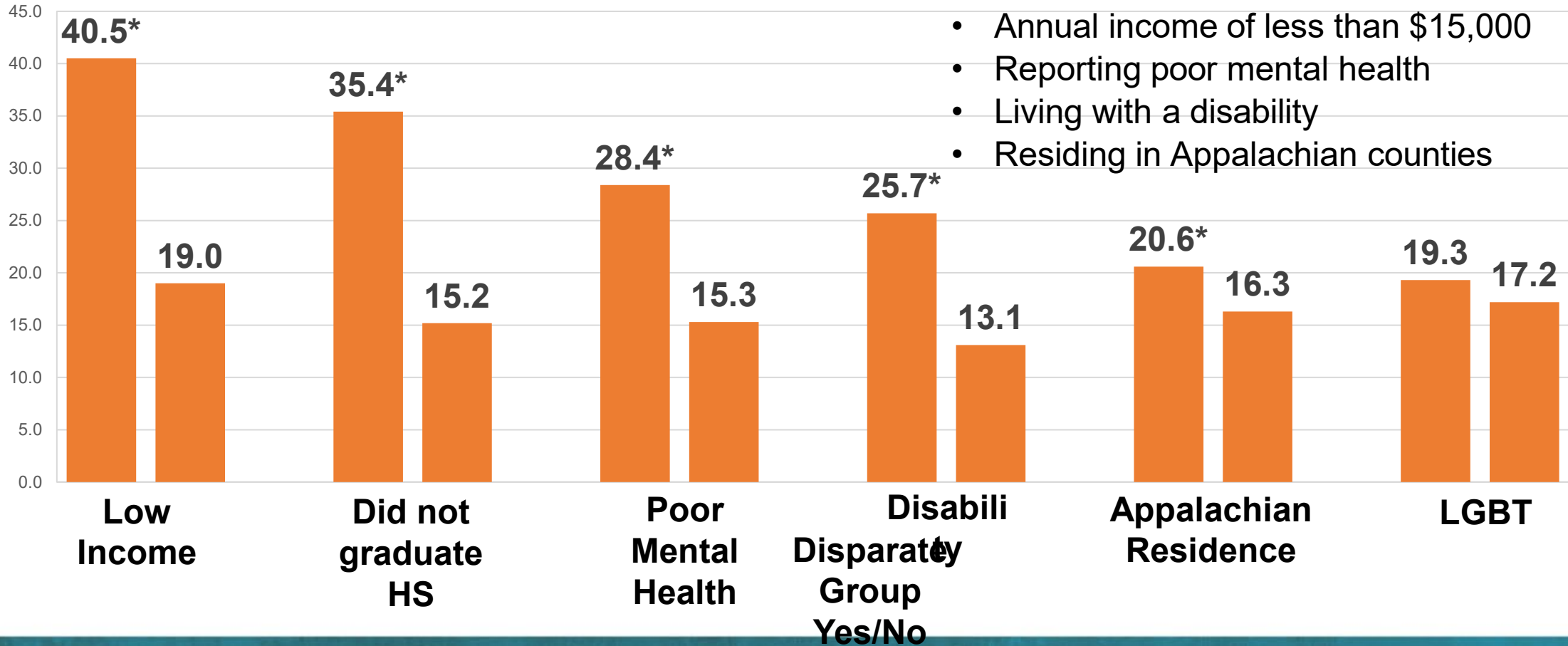
*Statistical significance

Current E-Cigarette Use Prevalence by Age, Ohio 2022



*Significantly higher prevalence than the other age groups.

Cigarette Use-Related Disparities, Ohio Adults, 2022

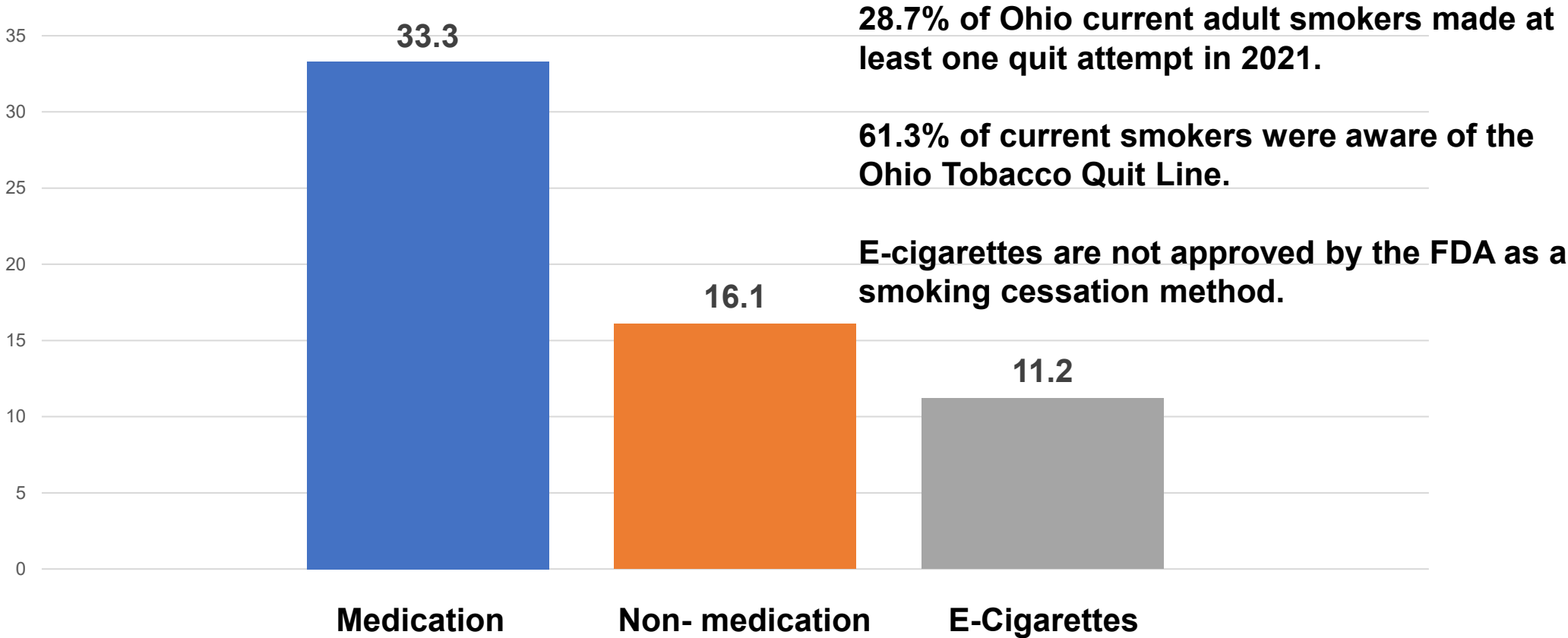


Ohio Populations At Increased Risk



- Individuals designating as multi-race
- Recipients of Medicaid and TRICARE, Indian Health Service, state-sponsored programs
- Low educational attainment
- Low income
- Disabled
- Regularly experience mental distress, poor mental health
- Middle School, High School, age 18-24

Quit Methods Used by Adult Smokers, Ohio 2021



2021 Ohio Behavioral Risk Factor Surveillance System, Chronic Disease Epidemiology and Evaluation, Ohio Department of Health, 2022.

E-Cigarettes for Cessation

- None are FDA-approved for tobacco cessation
- Those using e-cigarettes in quit attempts were less likely to have successfully quit cigarettes compared to those who used a pharmaceutical aid or no product at all
- 60% of former smokers who became daily e-cigarette users relapsed to cigarette smoking
- E-cigarettes can produce acrolein, acetaldehyde, and formaldehyde that can cause lung and heart disease

Chen R, Pierce JP, Leas EC, et al. Effectiveness of e-cigarettes as aids for smoking cessation: evidence from the PATH Study cohort, 2017–2019. *Tob Control* 2023;32:e145–e152.

Behavioral Cessation Methods

***Evidence for tobacco cessation is strongest for:*¹**

- Physician and nurse advice
- Telephone quit line counseling
- Tailored self-help materials
- Brief in-person counseling (<10 min) by primary care providers increases the proportion of adults who quit smoking and remain abstinent for 1 year²
- Even minimal interventions (<3 min) have been found to increase cessation rates²

1. Stead LF, et al. *Cochrane Database Syst Rev.* 2013;5:CD000165.
2. USPSTF Recommendations. *Ann Intern Med.* 2015;163:622-634. doi:10.7326/M15-2023



Counseling Plus Medication are Most Effective for Cessation



- 33% of adult smokers use medication
- 7% use counseling
- 5% use both counseling and medication when trying to quit¹

1. Babb S, Malarcher A, Schauer G, Asman K, Jamal A. Quitting Smoking Among Adults—United States, 2000–2015. *Morbidity and Mortality Weekly Report* 2017;65(52):1457-64

The 5As Model

- 1) ASK the patient about smoking status.
- 2) ADVISE to quit smoking with personalized messages.
- 3) ASSESS willingness to quit.
- 4) ASSIST with motivational interviewing, self-help materials, problem solving, and support. May involve making referrals to other treatment providers.
- 5) ARRANGE to follow up during subsequent visits.

Cultural Humility



- An approach to genuinely attempting to understand the patient's identities related to race and ethnicity, gender, sexual orientation, disabilities, socioeconomic status, education, & social needs
- Meshes with cultural competence (knowledge of health-related beliefs, practices & cultural values)
- Assumes that there is always more to learn more about the evolving and dynamic nature of a patient's experiences

Prasad SJ et al. Cultural humility: treating the patient, not the illness. *Med Educ Online*. 2016; 21: 10.3402/meo.v21.30908. PMID: 26847853

Motivational Interviewing

- Consistent with cultural humility
- Involves learning about what is important to the individual, what they value
- 2011 meta-analysis – effect size for MI was twice as large for US minority populations (primarily African American and Hispanic) compared with the majority white population

Ohio Tobacco Quit Line (1-800-Quit-Now)



- **Phone + Online:** Coaching over the telephone, plus email, text, chat, web-based materials, and quit progress tracking via website; English, Spanish, & translation service
- **Phone Only:** Coaching over the phone, plus materials, quit planning, and quit progress tracking; 24/7
- **Online Only:** Materials, quit planning, and quit progress tracking via website
- **Pharmacotherapy:** First two weeks of NRT (patch, lozenge, gum) are free for those who work with a coach

- Report a 37% quit rate for those who use coaching and NRT
- 90% participant satisfaction rate
- <https://ohio.quitlogix.org/>



SmokeFree.gov

smokefree.gov



- Sponsored by the National Cancer Institute
- Texting, smartphone apps, social media
 - Planning to quit, withdrawal, cravings, stress, mood
 - Relapse prevention
 - Tailored texting, apps, & social media content for:
 - Women, teens, veterans, Spanish-speaking, over age 60
 - DipFreetxt for quitting smokeless tobacco
- NRT information for patients



Freedom from Smoking Program



- American Lung Association
www.lung.org/quit-smoking/join-freedom-from-smoking
- Self-paced apps for quitting, chat communication with counselors
- Group clinics (8 week-long facilitated small groups); may be offered by hospital systems
- Some programs have fees



Facilitating Referrals



- EHRs can be programmed for electronic referral of patients to:
 - Ohio Tobacco Quit Line (1-800-QUIT-NOW)
 - Technical guidance for EHR integration is available
 - National Cancer Institute's smokefree.gov suite of cessation resources
 - Health system-based smoking cessation programs
 - Community-based smoking cessation programs
- Optimizing workflow: Care team members can implement the referral process via EHR, online, or via fax



Additional Resources for Quitting



- Tobaccofree.org
 - Point-of-care materials, patient-level information about how to quit, videos for schools, speakers, advocacy
- National Cancer Institute's free Smoking Quitline, 1-877-44U-Quit
- www.BecomeAnEx.org
 - For tobacco users who want to quit. Personalized quit plans, text messages, online support groups.
- Nicotine-anonymous.org
 - Group support using the Twelve Steps to achieve abstinence from nicotine. Five in-person meetings in Cleveland area, 56 Zoom support groups available.
- www.cdc.gov/tobacco/index.htm
 - Quit information, information and tools for healthcare providers
- Million Hearts
 - https://millionhearts.hhs.gov/files/Tobacco_Cessation_Change_Pkg.pdf
 - Guidance and tools for developing clinic- and system-level cessation programs
- QuitAssist.com – links to many smoking cessation resources (industry sponsored)



Recap



- Ohio has one of the highest rates of smoking in the nation
- Disparities in tobacco use
 - Designating as multi-race, Medicaid recipients, low educational attainment, low income, disabled, regularly experience mental distress, youth
- The 5 A's, MI and Cultural Humility can facilitate smoking cessation discussions with members of diverse populations
- Refer patients to the Ohio Tobacco Quit Line, Smokefree.gov, Freedom from Smoking program, or community resources
- For patients who are not ready, request permission to resume the discussion at a future visit
 - Brief MI-based conversations over multiple visits
 - Support the patient in moving through the stages of change



Learning Objectives

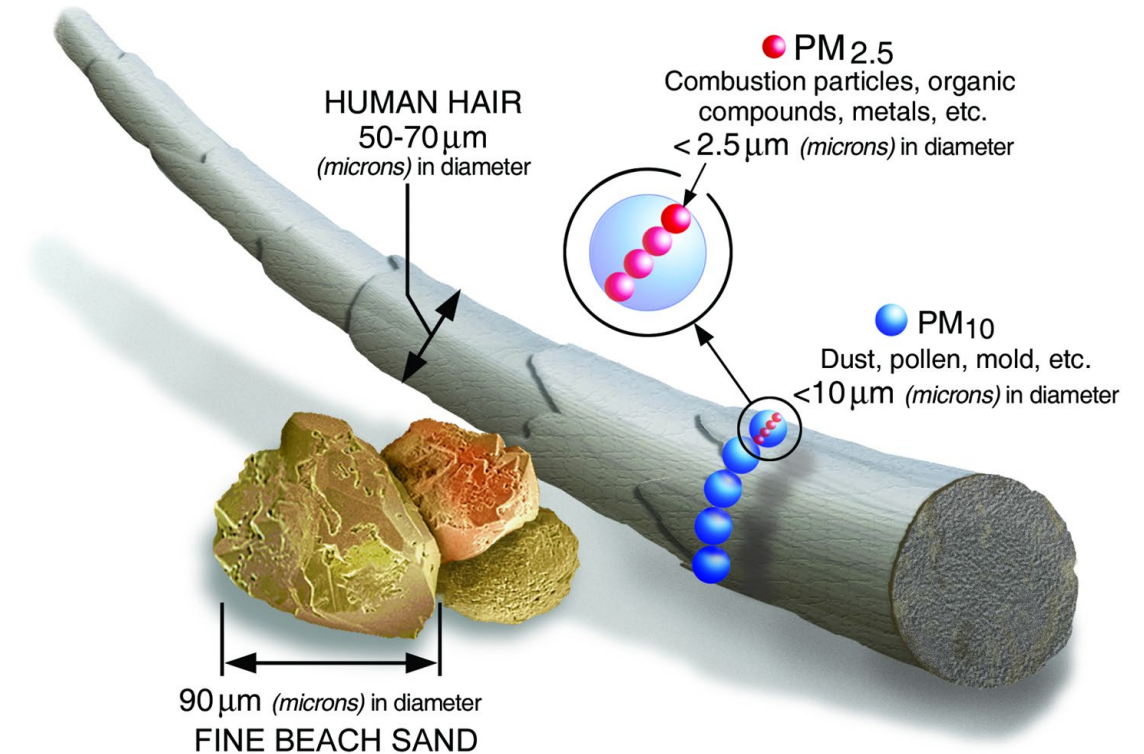


1. List a minimum of three environmental pollutants responsible for increased cardiovascular risk.
2. Describe disparities in exposure to environmental pollutants among different racial and ethnic groups in the United States.
3. List a minimum of two resources to identify communities prone to increased cardiovascular risk due to environmental pollutants.



Air pollution is the primary type of pollutant to be considered.

- $PM_{2.5}$
 - Refers to particulate matter 2.5 μm (micrometers) in diameter
 - Sulfates and organic carbon
- Ozone gas

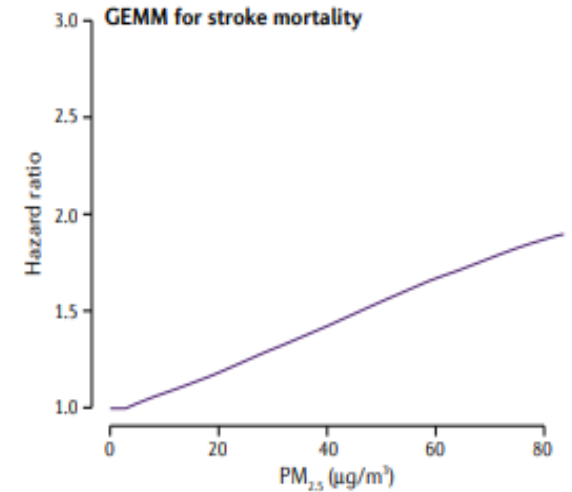
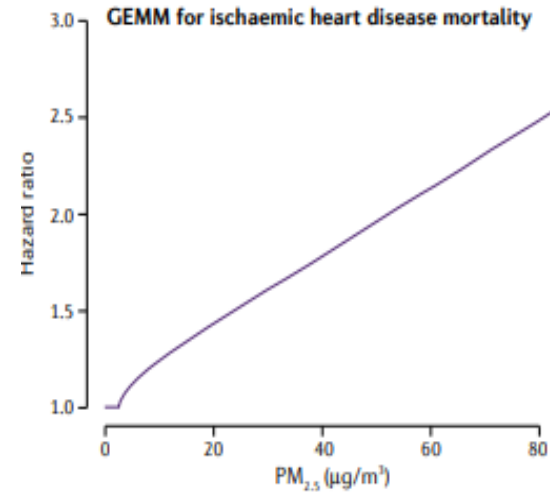
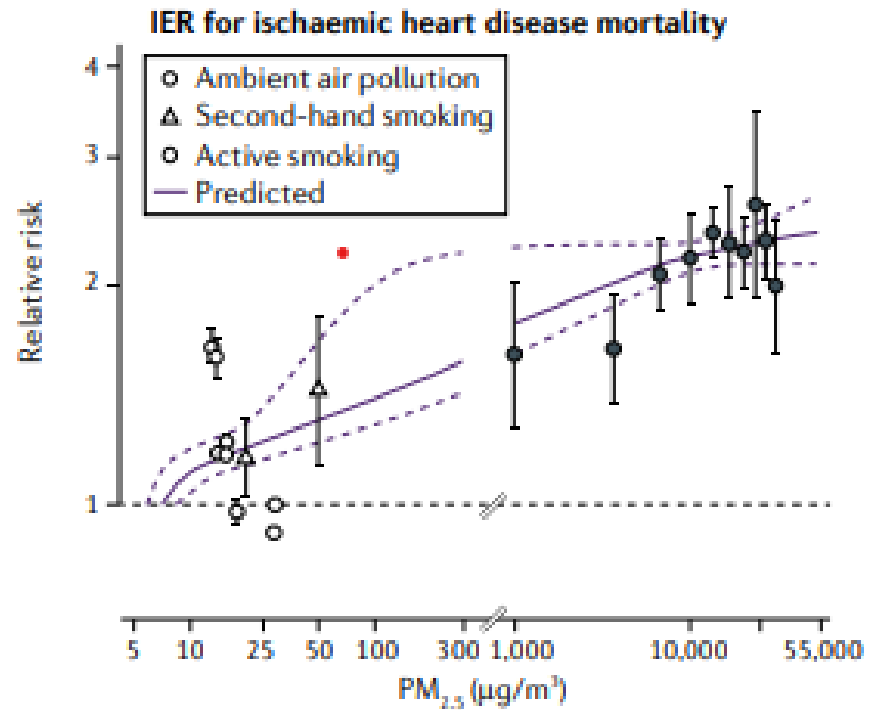


Air pollution convincingly linked to cardiovascular morbidity and mortality.



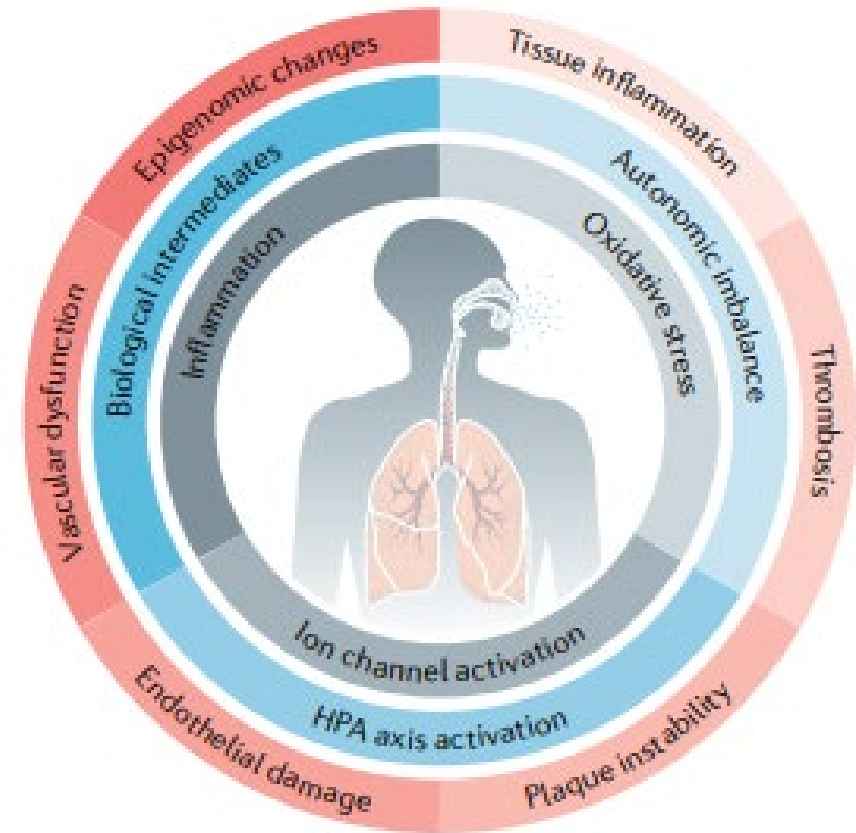
- Integrated Exposure-Response (IER) Model:
 - PM_{2.5} resulted in 4.2 million deaths and 103.1 million disability-adjusted life years lost in 2015 representing 7.6% of global mortality and 4.2% of global DALYS lost.
 - The number of deaths attributed to ambient air pollution alone was more than the sum of deaths attributed to ischemic heart disease, stroke, COPD, lung cancer, and lower respiratory tract infections.

Dose Dependency



Mechanisms and Harvesting Effect

- Harvesting Effect: Mortality displacement.

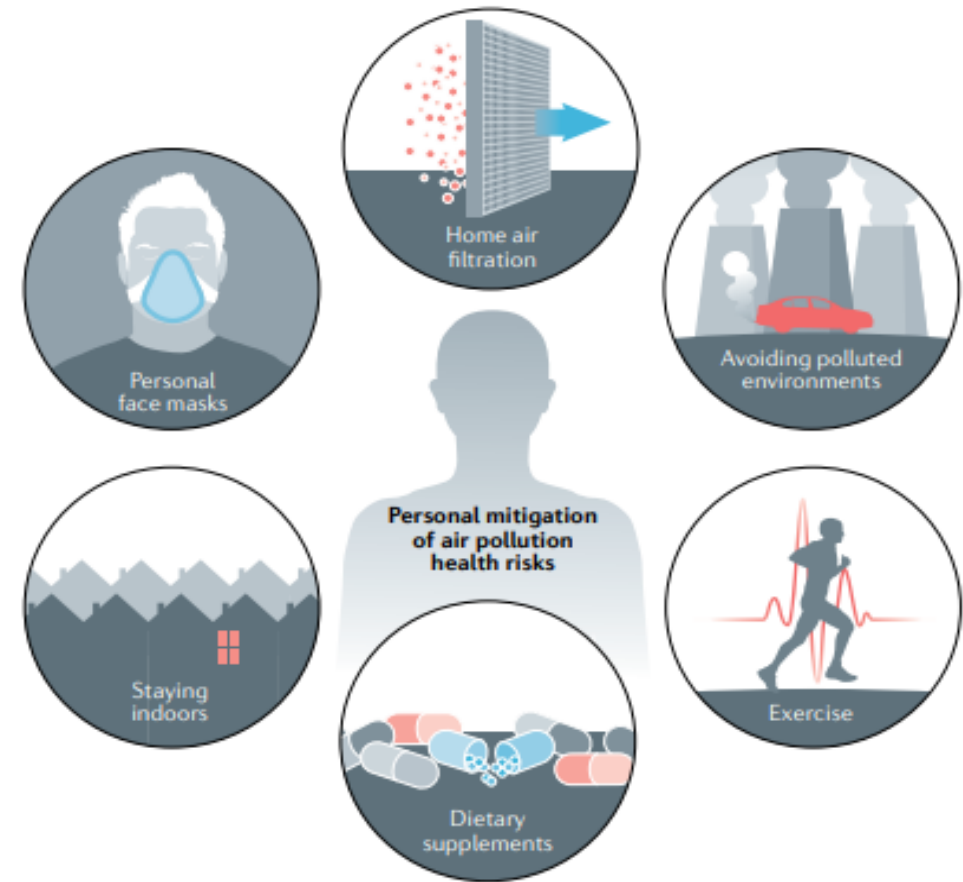


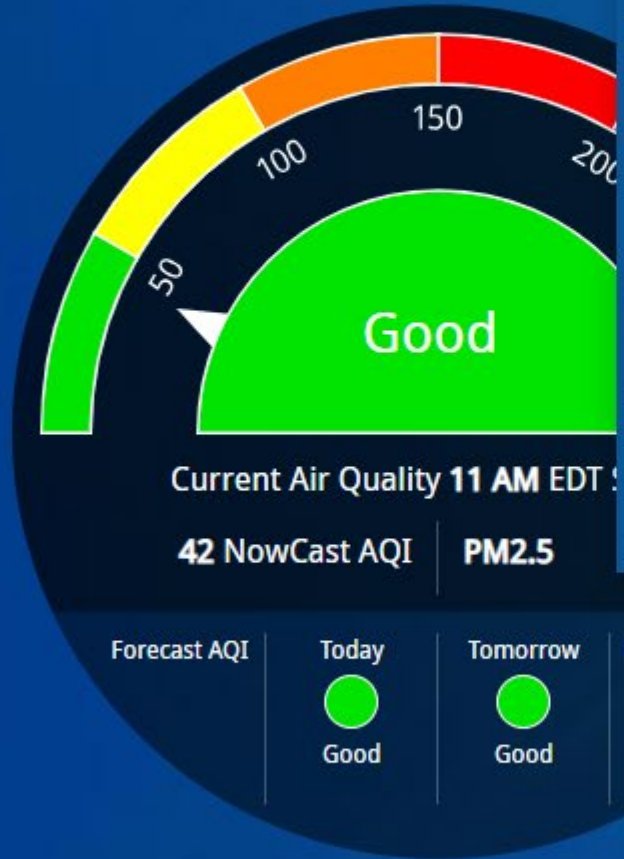
Consequences

- Atherosclerosis: Each $5\mu\text{g}/\text{m}^3$ increase in $\text{PM}_{2.5}$ is associated with progression of coronary calcium of 4.5 Agatson units per year.
- Hypertension: Short-term increases upon exposure; air filtration systems reduce SBP by 3.2mmHg.
- Acute/Coronary Syndrome/MI: Each $10\mu\text{g}/\text{m}^3$ increase in $\text{PM}_{2.5}$ associated with a 2.5% relative increase in risk of MI.
- Arrhythmias/heart failure/peripheral arterial disease/venous thromboembolism/diabetes/stroke.

What can we do?

- Public Health Measures/Societal/Governmental Reform
 - Vehicle emissions
 - Reforestation
 - Decarbonization as a health strategy to complement climate change mitigation.





- Interactive Map
- National Maps
- Fire and Smoke Map
- Using AirNow During Wildfires
- Information by state
- Past Data
 - By City
 - By Monitor
- U.S. Embassies & Consulates
- AirData
- AirCompare
- Developers/API
- AirNow Mobile App

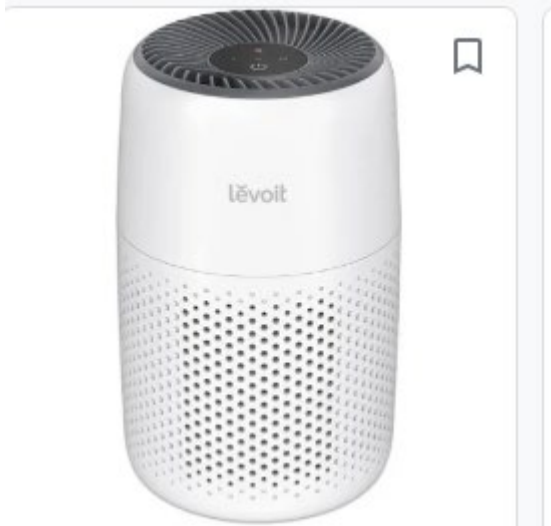
Wildfire Smoke

ZIP Code, City, or State

Chagrin Falls, OH

Cleveland-Akron-Lorain Reporting Area

- Fire & Smoke Map
- Monitors Near Me
- Recent Trends



Levoit Air Purifiers for Bedroom Home, HEPA Filter Cleaner with Fragrance Sponge

4.8 ★★★★★ 500

\$49.99

[Levoit](#)

Free delivery by Mon, Sep 18

Table 3. Current Cigarette Smoking Among US Adults Aged 18 or Older, By Sociodemographic Characteristics and Poverty Status , National Survey on Drug Use and Health, 2011–2014

Characteristic	Men		Women		Total	
	Below, % (95% CI)	At or Above, % (95% CI) [P Value]	Below, % (95% CI)	At or Above, % (95% CI) [P Value]	Below, % (95% CI)	At or Above, % (95% CI) [P Value]
Overall^c	41.1 (39.8–42.5)	23.7 (23.2–24.2) [$<.001$]	32.5 (31.4–33.6)	18.3 (17.8–18.7) [$<.001$]	36.0 (35.1–36.9)	20.9 (20.6–21.3) [$<.001$]
Age, y						
18–24	38.9 (37.5–40.3)	35.4 (34.6–36.2) [$<.001$]	28.6 (27.6–29.7)	24.7 (24.0–25.4) [$<.001$]	33.2 (32.3–34.2)	30.3 (29.8–30.9) [$<.001$]
25–44	45.3 (43.2–47.5)	30.0 (29.3–30.8) [$<.001$]	35.9 (34.3–37.5)	22.2 (21.5–22.8) [$<.001$]	39.6 (38.3–41.0)	26.2 (25.6–26.7) [$<.001$]
45–64	43.4 (40.5–46.4)	20.7 (19.8–21.6) [$<.001$]	39.2 (36.6–41.9)	18.6 (17.8–19.4) [$<.001$]	41.0 (39.0–43.1)	19.6 (19.0–20.3) [$<.001$]
≥65	20.4 (14.8–27.4)	10.1 (9.1–11.2) [.002]	13.5 (10.8–16.8)	8.7 (7.9–9.5) [.002]	15.7 (13.1–18.8)	9.3 (8.6–10.0) [$<.001$]
Race/ethnicity						
Non-Hispanic white	50.9 (48.9–52.9)	23.7 (23.2–24.3) [$<.001$]	44.8 (43.1–46.5)	20.2 (19.7–20.8) [$<.001$]	47.4 (46.1–48.7)	22.0 (21.5–22.4) [$<.001$]
Non-Hispanic black	44.1 (41.2–47.1)	25.9 (24.3–27.5) [$<.001$]	30.9 (28.6–33.3)	15.8 (14.6–17.1) [$<.001$]	35.9 (34.1–37.8)	20.6 (19.6–21.7) [$<.001$]
American Indian/Alaska Native	53.7 (43.7–63.4)	35.7 (29.1–42.9) [.004]	49.0 (40.2–57.8)	31.7 (26.1–37.9) [$<.001$]	50.8 (43.6–58.0)	33.7 (29.3–38.5) [$<.001$]
Non-Hispanic Asian	24.2 (18.4–31.0)	14.5 (12.7–16.6) [.004]	7.6 (5.3–10.7)	5.7 (4.7–7.0) [.22]	15.0 (12.0–18.7)	9.8 (8.7–10.9) [.004]
Hispanic	25.5 (23.3–27.8)	23.5 (22.3–24.8) [.14]	16.8 (15.2–18.6)	13.1 (12.0–14.2) [$<.001$]	20.4 (19.1–21.8)	18.6 (17.8–19.5) [.02]
US Census region^d						
Northeast	39.6 (36.4–42.9)	31.5 (29.8–33.2) [$<.001$]	31.2 (28.6–34.0)	18.4 (17.4–19.4) [$<.001$]	34.4 (32.5–36.5)	20.4 (19.6–21.2) [$<.001$]
Midwest	49.1 (46.3–51.8)	25.5 (24.6–26.4) [$<.001$]	41.3 (39.0–43.7)	21.1 (20.4–21.9) [$<.001$]	44.6 (42.8–46.4)	23.3 (22.6–23.9) [$<.001$]
South	43.2 (41.0–45.4)	25.0 (24.2–25.8) [$<.001$]	32.9 (31.2–34.6)	19.1 (18.3–19.9) [$<.001$]	37.1 (35.7–38.5)	22.0 (21.4–22.6) [$<.001$]
West	32.3 (29.7–35.0)	21.0 (19.9–22.1) [$<.001$]	25.4 (23.4–27.6)	14.1 (13.2–15.0) [$<.001$]	28.4 (26.7–30.1)	17.5 (16.8–18.3) [$<.001$]

^a Household income in relationship to the federal poverty level.

Cost of 1ppd in Ohio: \$2416 annually.

The poor suffer disproportionately



Variable	Proportion of Population, %	PM _{2.5} Burden, Absolute (Proportional)	PM ₁₀ Burden, Absolute (Proportional)	Facility Burden, Absolute (Proportional)
Overall population	1.00	22.4 (...)	29.2 (...)	5.7 (...)
Race/ethnicity ^a				
White	0.63	18.8 (0.84)	24.7 (0.85)	4.1 (0.72)
Non-White	0.37	28.6 (1.28)	37.0 (1.27)	8.5 (1.49)
Black	0.12	34.5 (1.54)	43.6 (1.49)	6.2 (1.09)
Hispanic	0.17	26.9 (1.20)	35.9 (1.23)	9.8 (1.70)
Poverty level				
Above poverty	0.85	20.9 (0.93)	27.2 (0.93)	5.5 (0.95)
Below poverty	0.15	30.3 (1.35)	39.3 (1.35)	7.2 (1.26)

Key Lessons

- PM_{2.5} are a major cause of cardiovascular morbidity and mortality.
- Carbon and sulfates are principal culprits among PM_{2.5}. Ozone is a major gaseous pollutant which adversely affects cardiovascular health.
- Avoiding polluting environments and circumstances is especially important for patients with cardiovascular risk factors or cardiovascular disease.
- Older patients with cardiovascular and respiratory illness should use masks, monitor air quality, and exercise indoors when outdoor air quality is poor.



Thank you!

Questions/Discussion