THE INHALED TRUTH:

Revelations from a 42M-Life Mortality Study on Tobacco Risk

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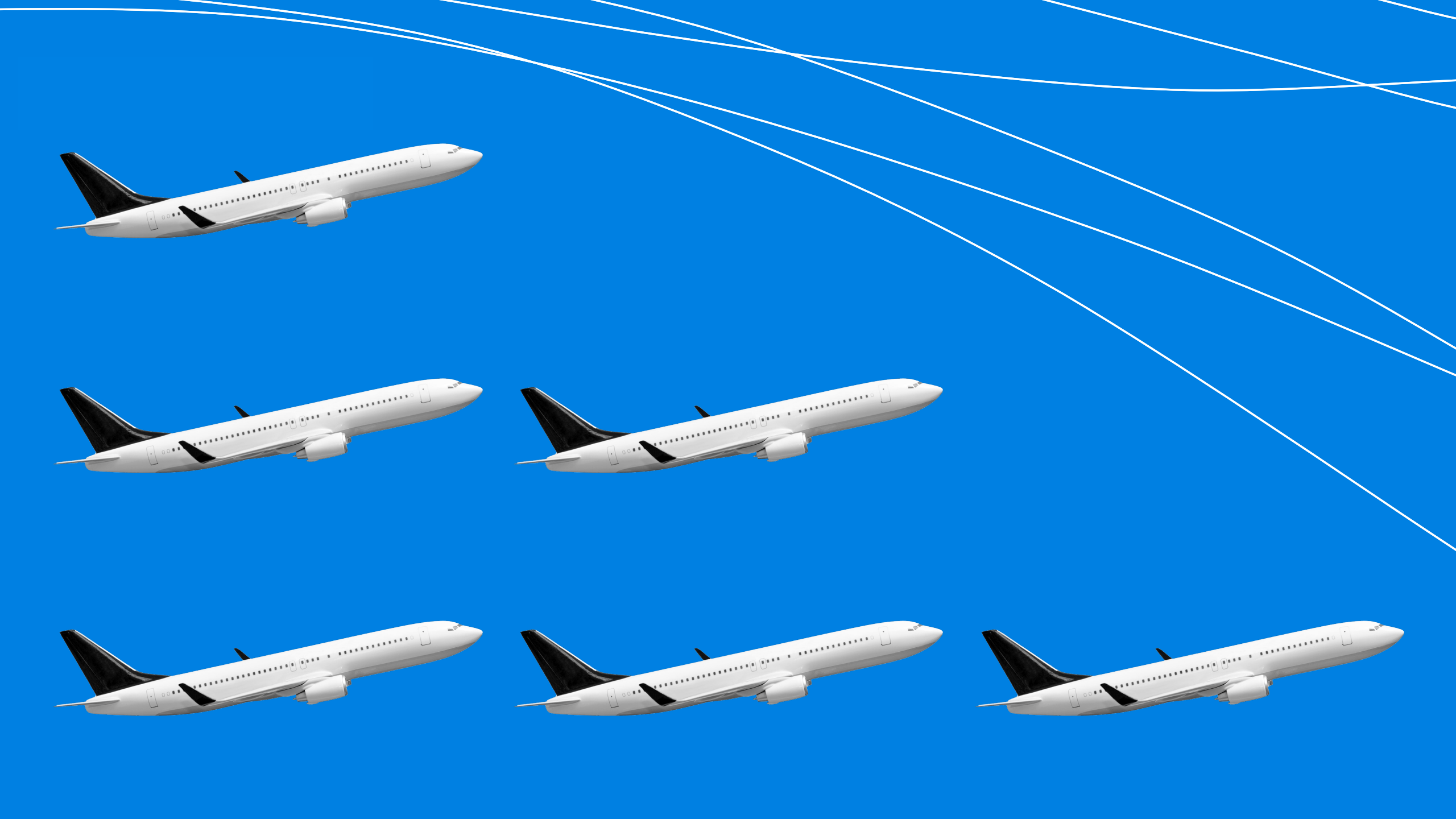


TOBACCO IS THE MAIN CAUSE OF PREVENTABLE DISEASE AND DEATH.

Centers for Disease Control and Prevention (2022)

Predominant cause of tobacco related morbidity and mortality

>16M with at least one smoking-related disease

>$600B in cost to the U.S.

- **$240B in health care**
- **$372B due to lost productivity**

>480,000 deaths annually

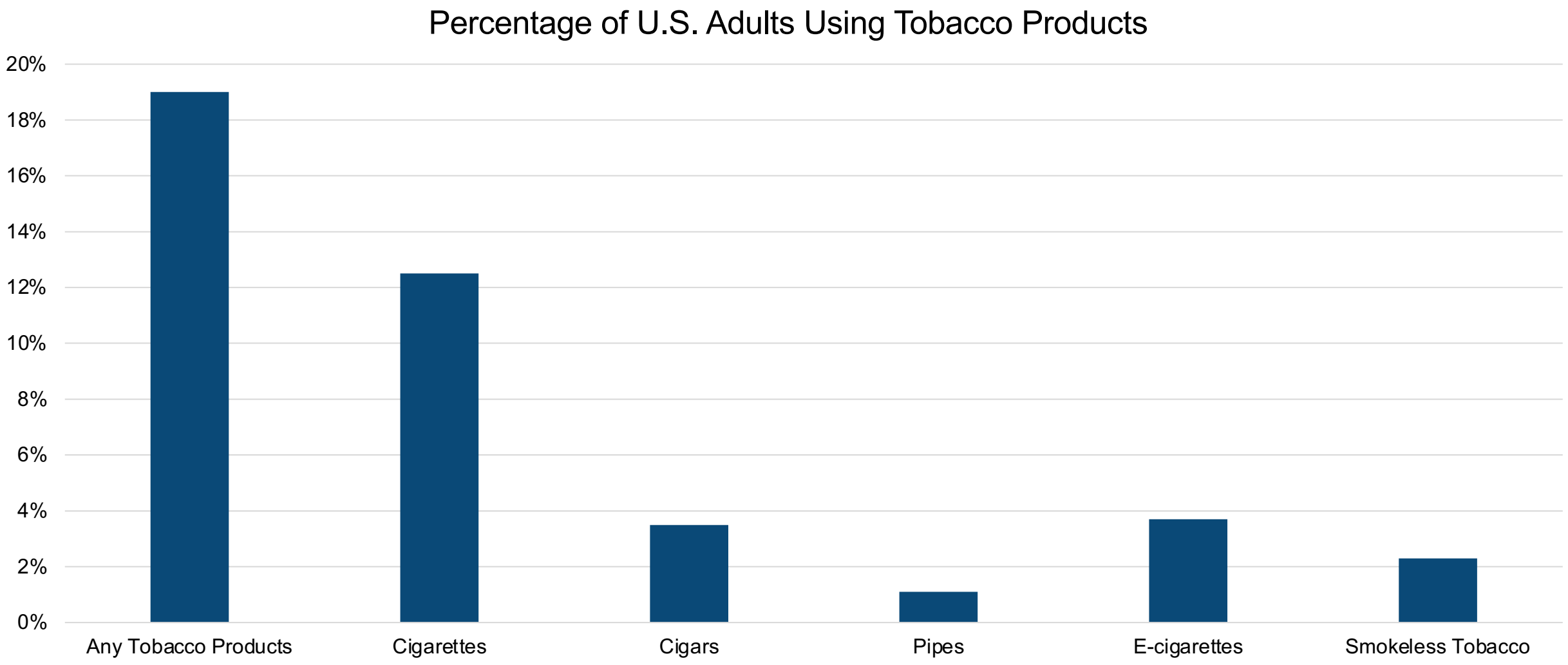
AGENDA

- Tobacco trends in the U.S.
- Health impact of tobacco use
- Identifying nicotine dependence
- Milliman 42M-life mortality analysis
- Vaping and e-Cigarettes

TOBACCO TRENDS

NEARLY ONE IN FIVE ADULTS REPORTED TOBACCO PRODUCT USE.

Centers for Disease Control and Prevention (2020)



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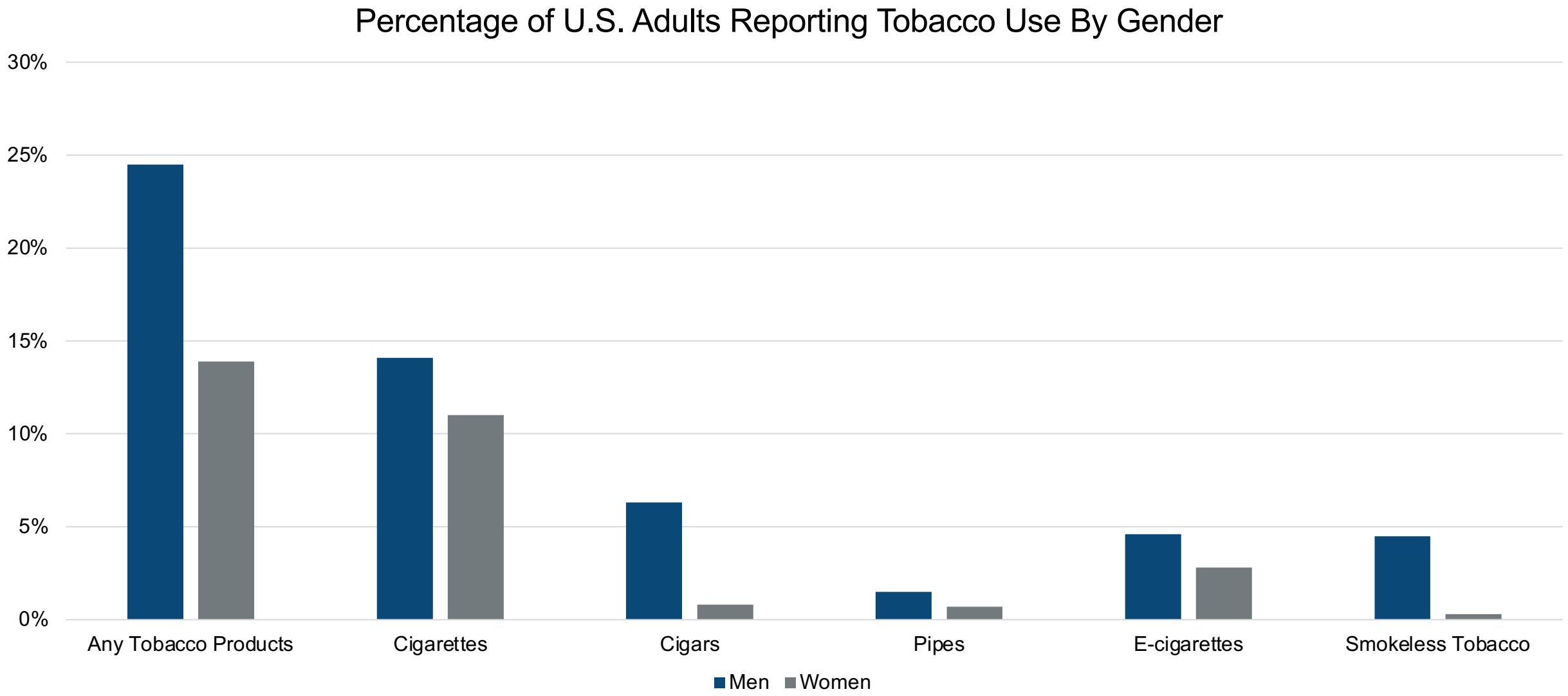
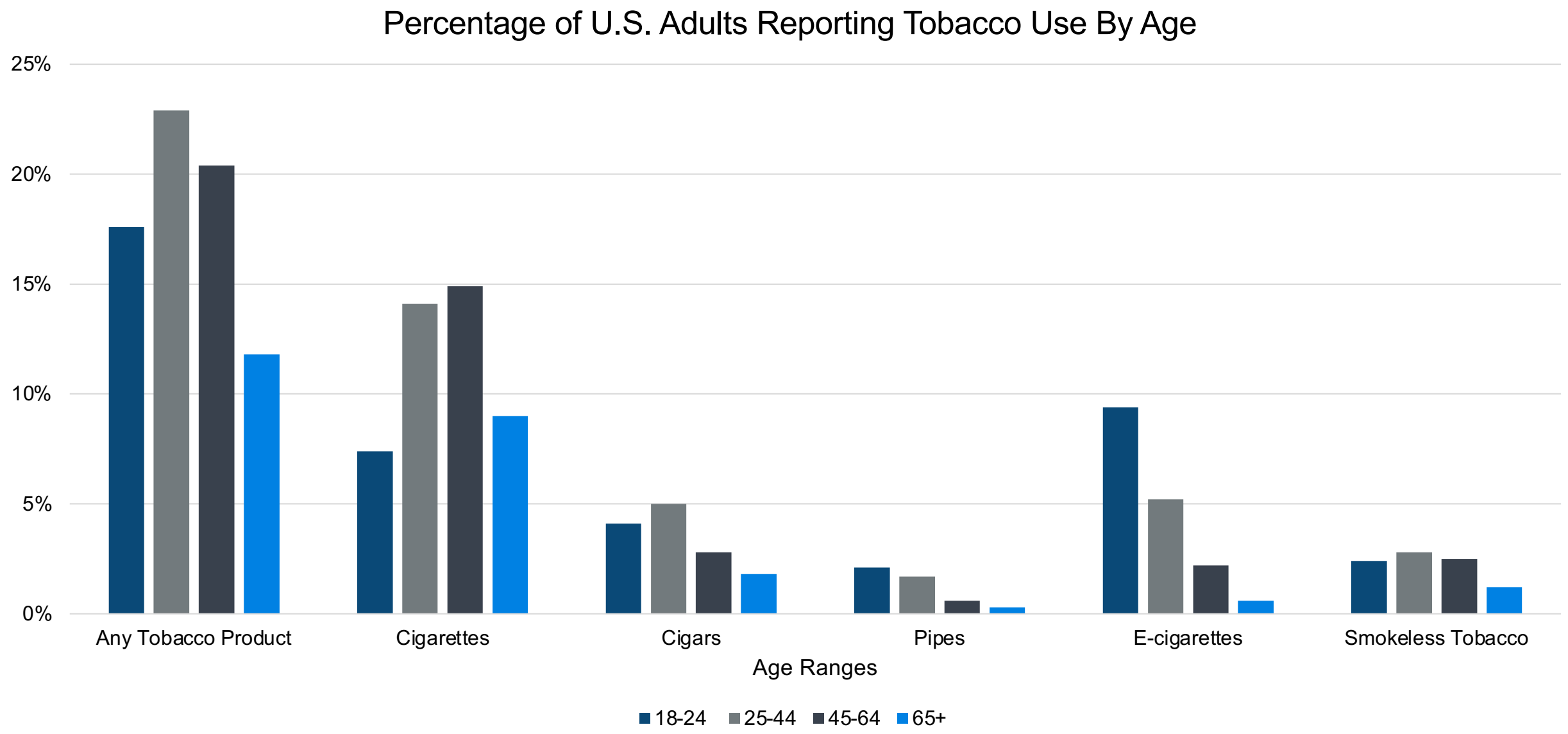


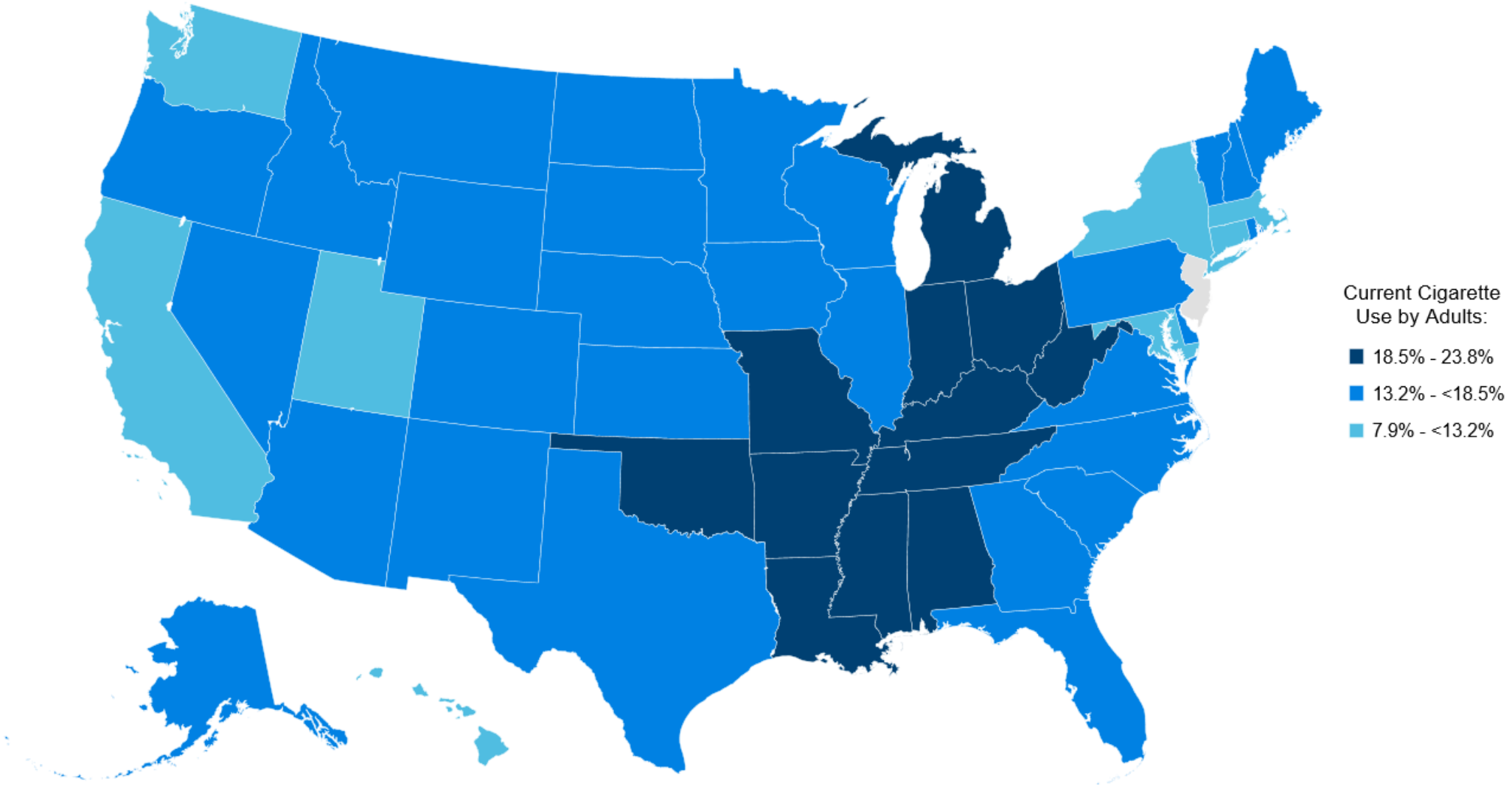
TOBACCO USE VARIES BY AGE.

Centers for Disease Control and Prevention (2020)



TOBACCO USE VARIES BY STATE.

Centers for Disease Control and Prevention (2020)



TOBACCO AND ITS IMPACT ON THE BODY

NICOTINE BINDS TO RECEPTORS IN THE BRAIN AND BODY.

Central nervous system

Nicotine binds to receptors in the brain

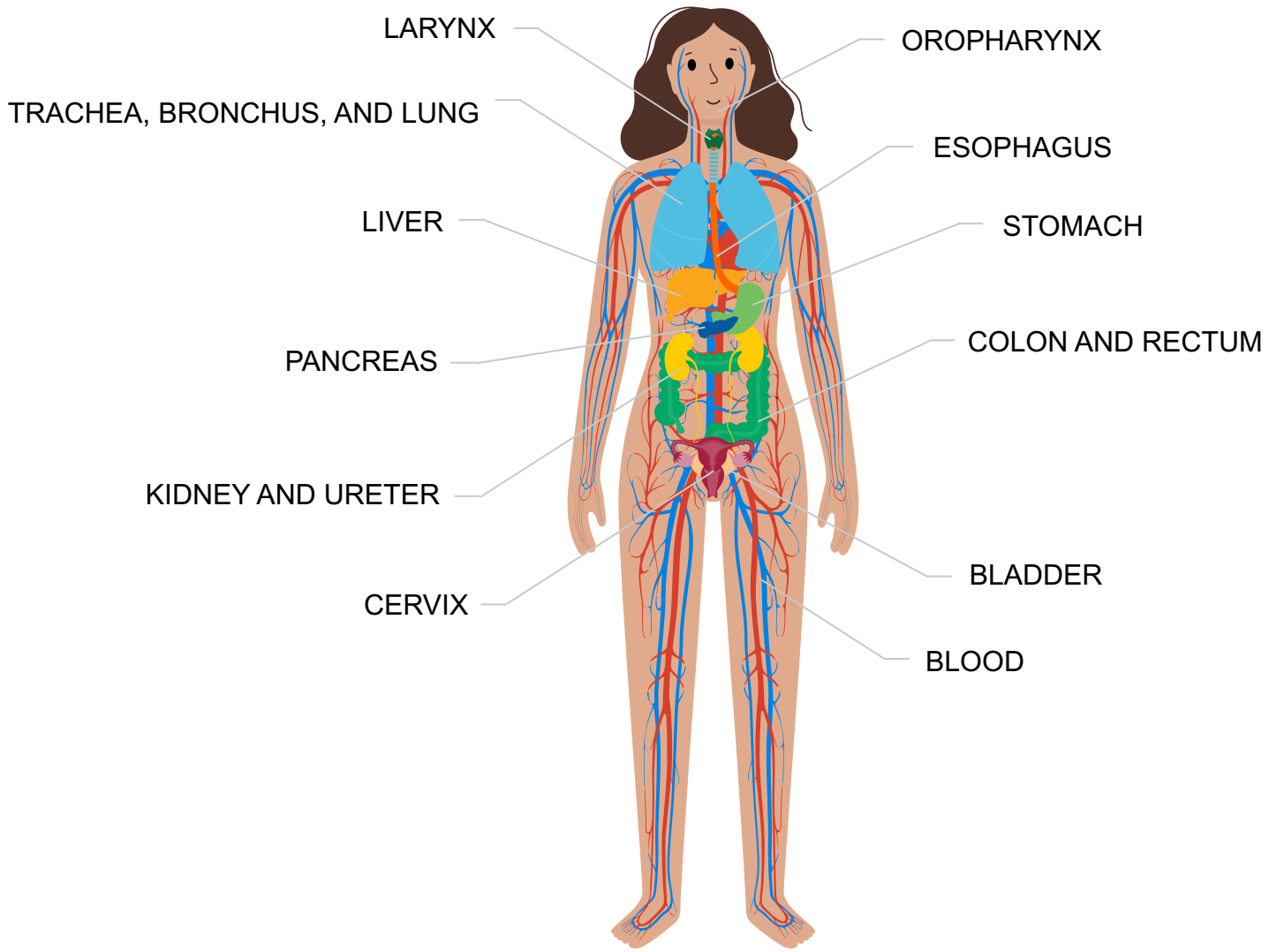
- Dopamine is released
  - Reward pathway

Peripheral nervous system

Nicotine binds to receptors in adrenal medulla

- Releases epinephrine and norepinephrine
  - Stimulant effect
  - Increases blood pressure and heart rate
  - Increases oxygen demand of heart

SMOKING CAN CAUSE CANCER IN MOST ORGANS OF THE BODY.



SMOKING INCREASES RISK FOR SERIOUS CONDITIONS.

LUNGS

Leading cause of COPD

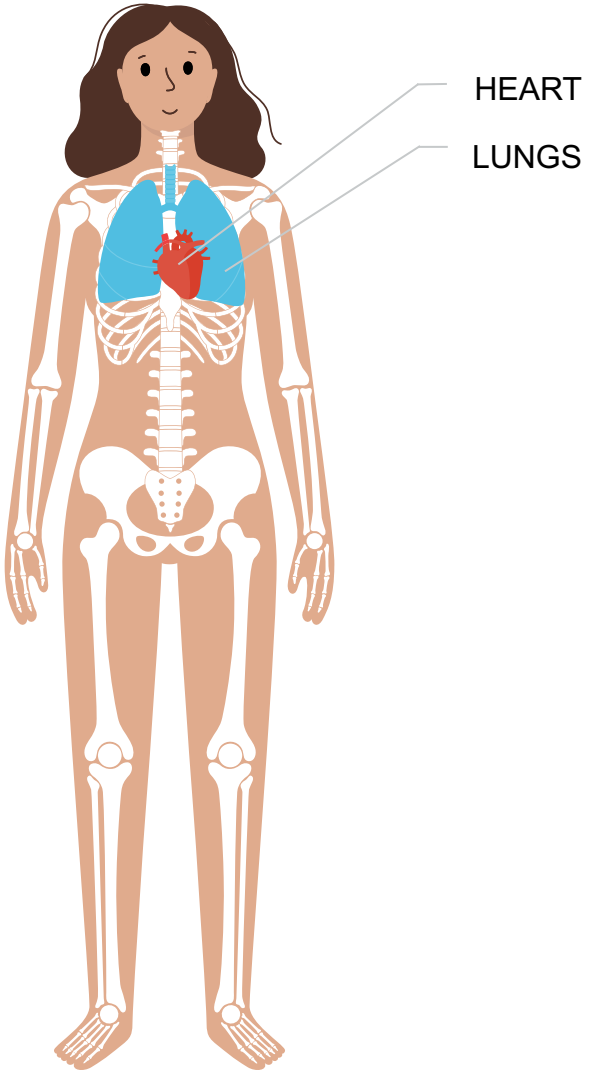
- 80% of COPD-related deaths
- 12–13 times more likely to die from COPD

Can trigger an asthma attack

HEART

Contributes to:

- Cardiovascular disease
- Damaged blood vessels
- Increased risk of coronary heart disease



SMOKING INCREASES RISK FOR SERIOUS CONDITIONS.

BRAIN

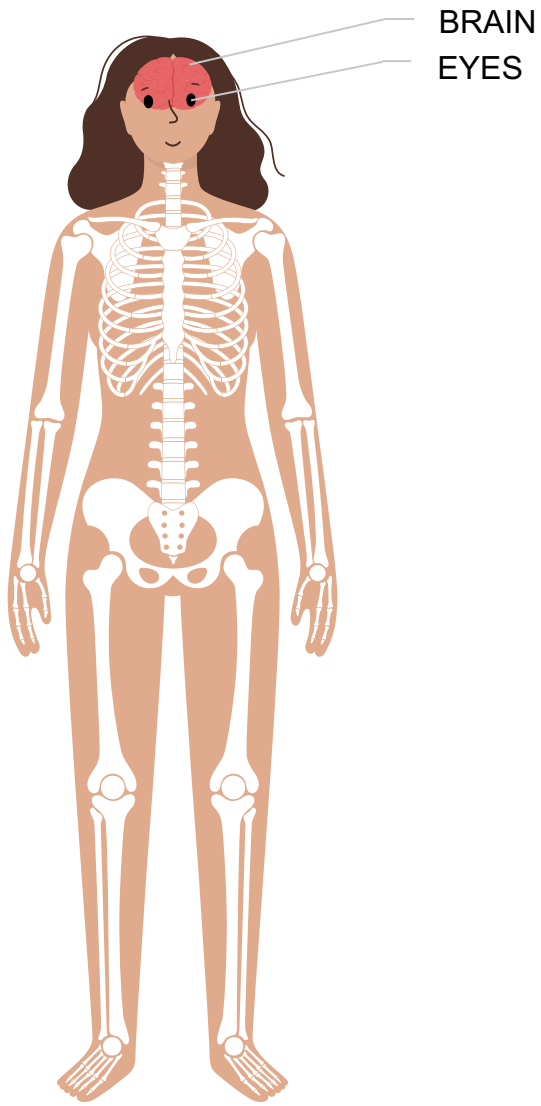
Role in nicotine addiction

Increased risk for stroke

EYES

Increases risk for cataracts

May cause age-related macular degeneration



SMOKING INCREASES RISK FOR SERIOUS CONDITIONS.

GENERAL BODY

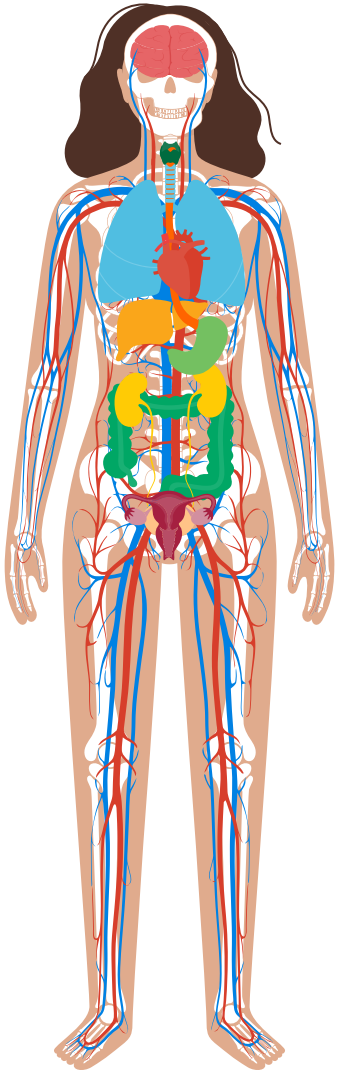
Increases risk of type 2 diabetes.

- Nicotine increases blood sugar levels.
- Higher risk for diabetic comorbidities.

May also affect:

- Bone health
- Inflammation
- Immune function
- Development of rheumatoid arthritis

Secondhand smoke causes ~41,000 deaths/year



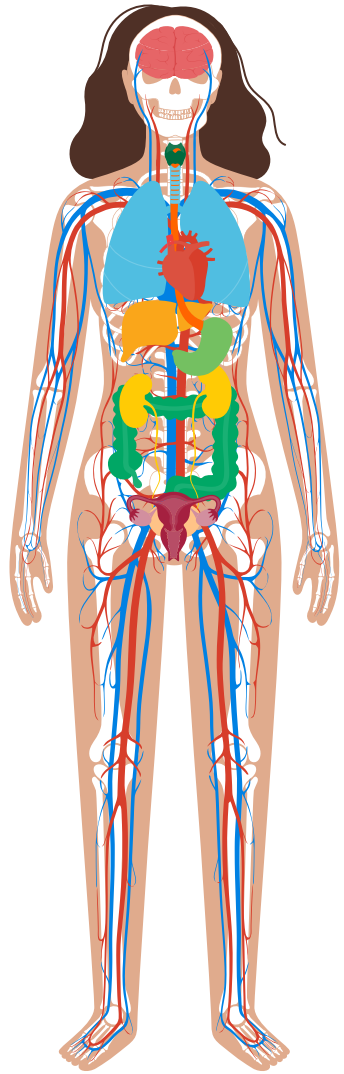
FEMALE RISK OF SMOKING IS HIGHER THAN MALES.

Howe et al. Am J Cardiol (2011)

- In a systematic review and meta-analysis of 75 cohorts that evaluated the risks of smoking on coronary heart disease and adjusted for the effects of other known coronary heart disease risk factors:
  - Over 2.4 million persons with over 44,000 coronary events

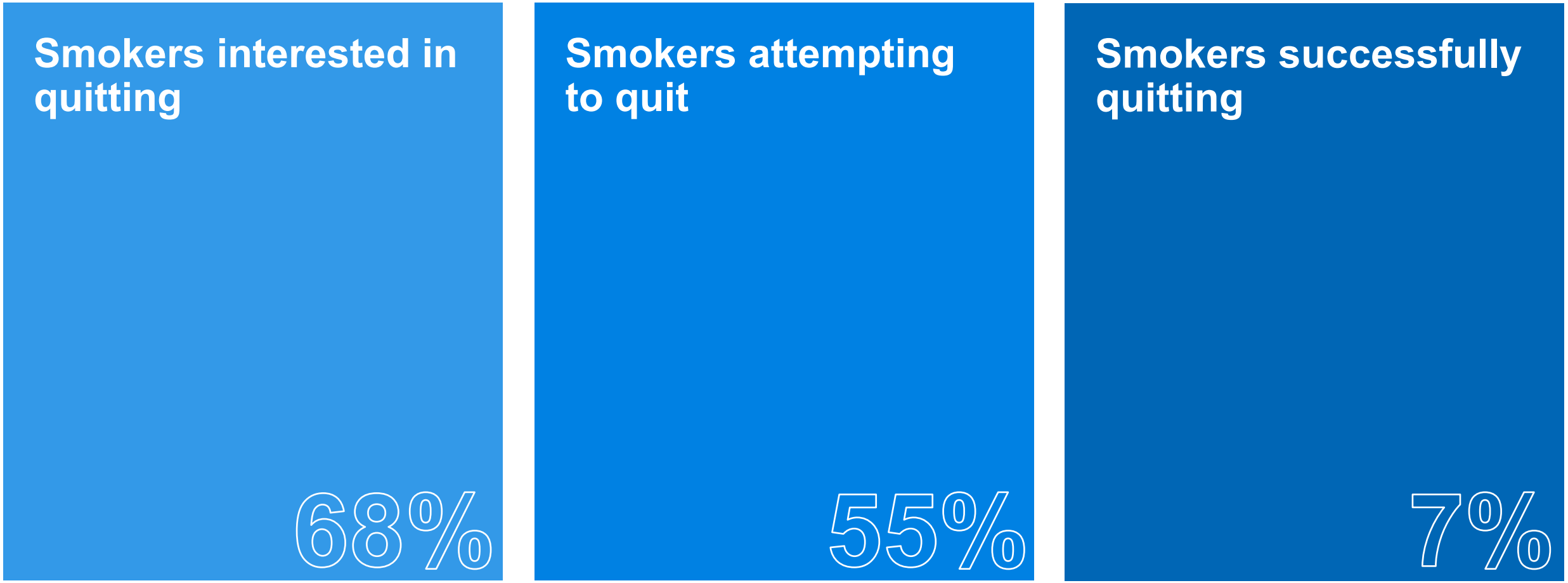
- Female smokers were 25% more likely than male smokers to develop coronary artery disease.
  (RR 1.25, 95% CI 1.12-1.29)

- Female sex was also associated with more adverse events after acute coronary syndrome.

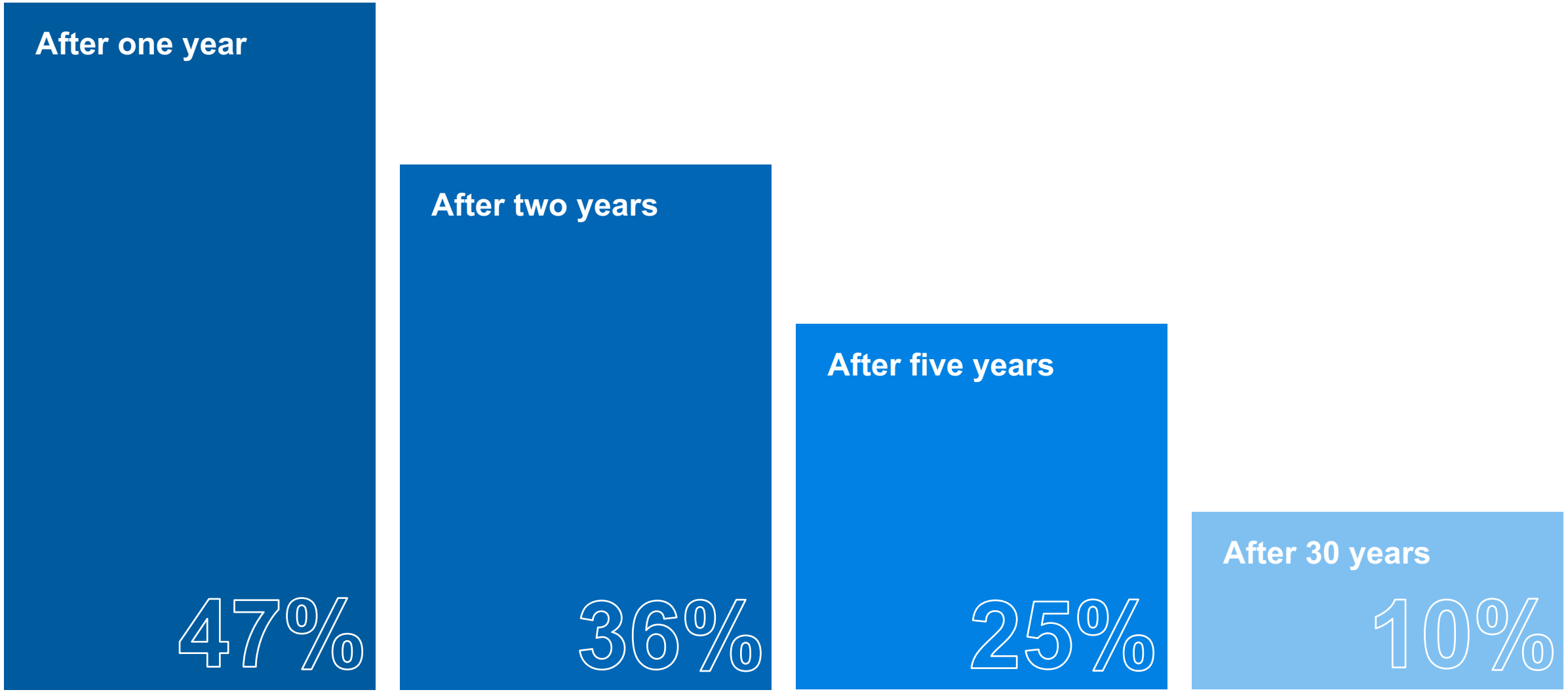


ALMOST 70% WHO SMOKE CIGARETTES WOULD LIKE TO QUIT.

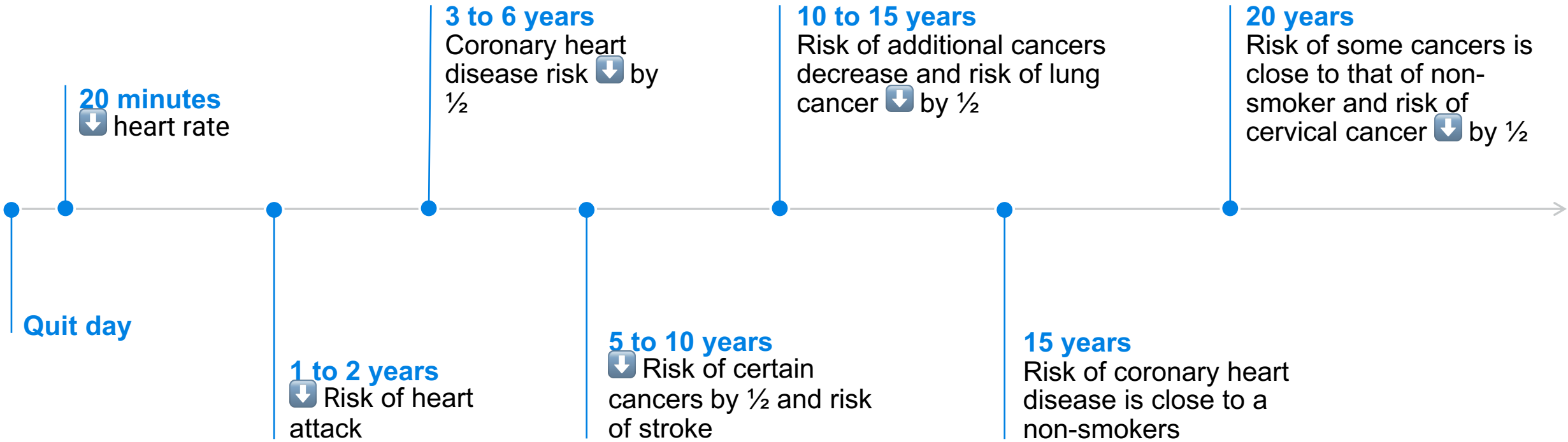
For some smokers, it may take 30+ attempts to successfully quit for ≥ 1 year.



RISK OF RELAPSE IS NEARLY 50% AFTER 12 MONTHS.



ADDED RISK FROM SMOKING CAN LINGER YEARS AFTER QUITTING.[1]



IDENTIFYING NICOTINE DEPENDENCE

NICOTINE USE IS FOUND WITH METHODS OF VARYING RELIABILITY.

Application

- Applicant self-disclosure

Cotinine test

- Metabolite of nicotine
- Tested on bodily fluid

Prescription fills

- Chantix
- Zyban
- Nicotine patches, gum, lozenges

Medical claims

- Tobacco use/nicotine dependence diagnosis codes
- Cessation codes (e.g., counseling)

NICOTINE DATA CAN BE GROUPED INTO THREE KEY CATEGORIES.

Active use

Medical Data codes indicating continued nicotine use or dependence

Dx

DIAGNOSIS		
Fracture of unspecified part of neck of left femur, initial encounter for closed fracture	ICD-10	S72.002A
Presence of left artificial hip joint	ICD-10	Z96.642
Long term (current) use of anticoagulants	ICD-10	Z79.01
Personal history of pneumonia (recurrent)	ICD-10	Z87.01
Tobacco use	ICD-10	Z72.0
PROCEDURE		
Occupational therapy, in the home, per diem	HCPCS	S9129
Social work visit, in the home, per diem	HCPCS	S9127
Home Health (HH) Medical Social Services: Visit charge	REV	0561

Cessation treatment

Prescription or Medical Data detailing efforts to treat nicotine dependence

Rx

HYDROXYZINE HYDROCHLORIDE (Hydroxyzine HCl)	MEDIUM	1 Fills
NICOTINE TRANSDERMAL SYSTEM (Nicotine)	MEDIUM	5 Fills
NICOTINE TRANSDERMAL SYSTEM STEP 2 (Nicotine)	MEDIUM	3 Fills

Dx

DIAGNOSIS		
Nicotine dependence, unspecified, uncomplicated	ICD-10	F17.200
PROCEDURE		
Office or other outpatient visit for the evaluation and management of an established patient, usually the presenting problem(s) are of low to moderate severity. Typically 15 minutes are spent face-to-face with the patient and/or family.(Significant, Separately Identifiable E&M Service by the Same Physician on the Same Day of a Procedure or Other Service)	CPT-4	99213
Smoking and tobacco use cessation counseling visit; intermediate, greater than 3 minutes up to 10 minutes	CPT-4	99406

Personal history

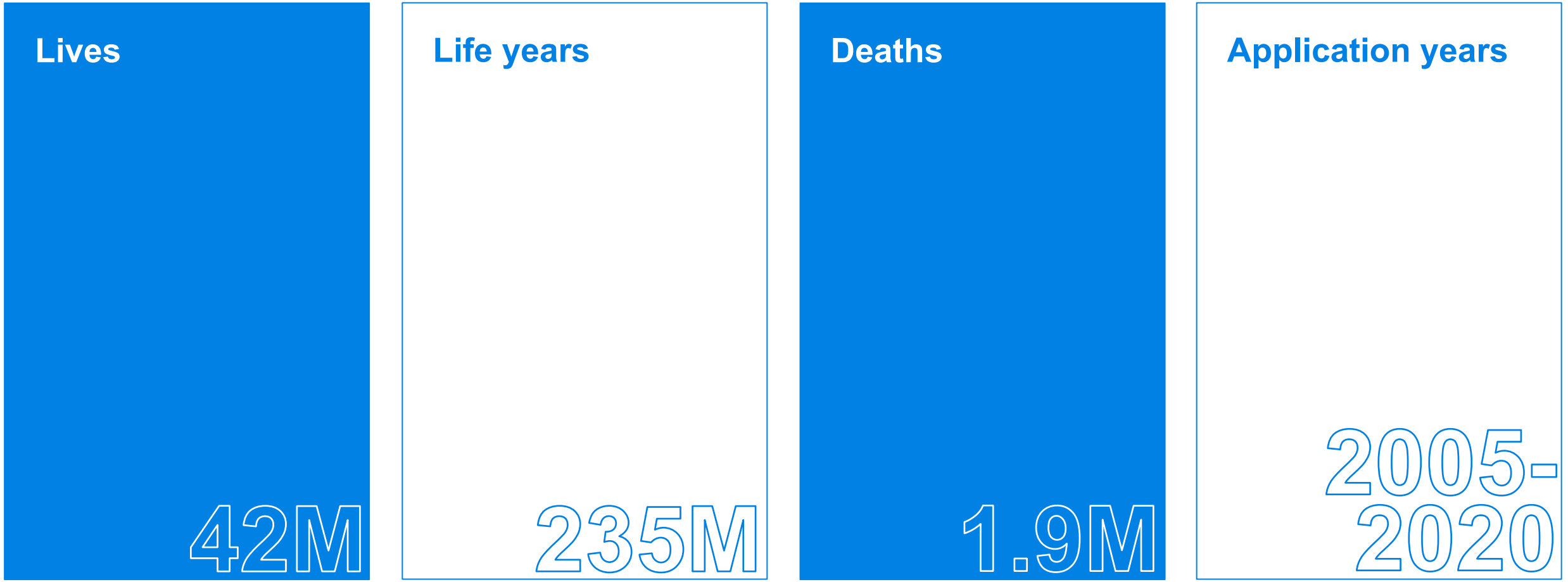
Medical Data documenting disclosure of previous nicotine use to medical provider

Dx

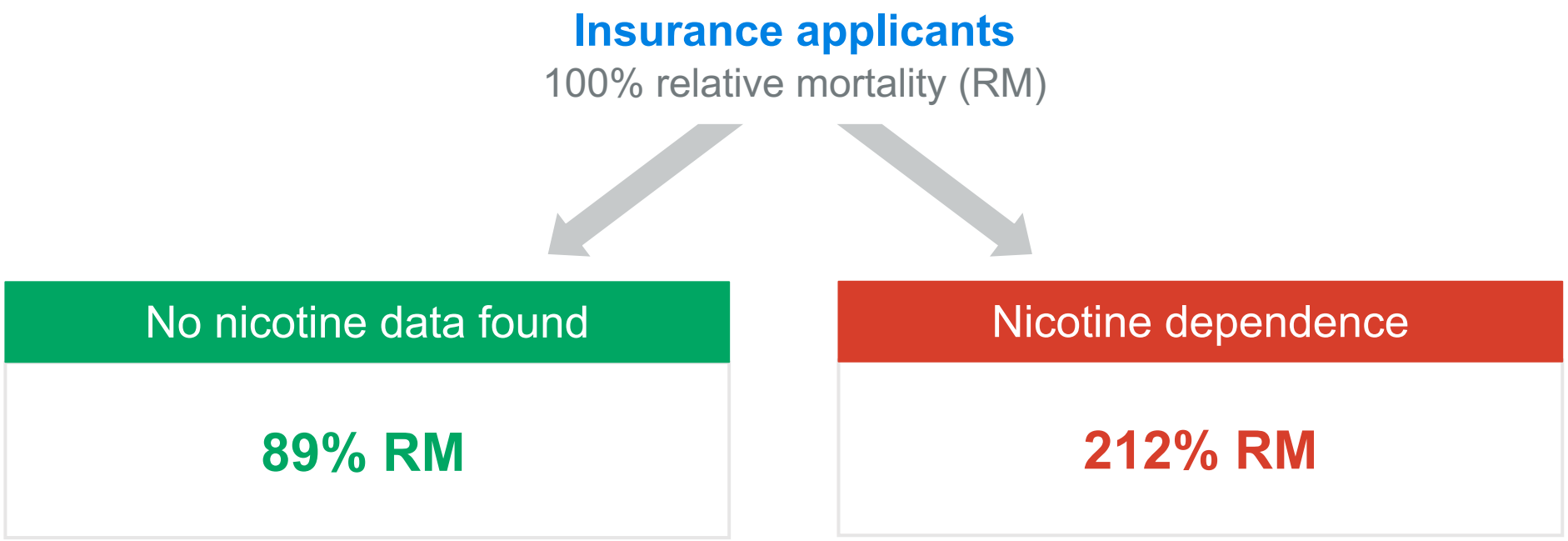
DIAGNOSIS		
Hypertensive heart disease with heart failure	ICD-10	I11.0
Heart failure, unspecified	ICD-10	I50.9
Respiratory failure, unspecified with hypoxia	ICD-10	J96.91
Personal history of nicotine dependence	ICD-10	Z87.891
Personal history of transient ischemic attack (TIA), and cerebral infarction without residual deficits	ICD-10	Z86.73
PROCEDURE		
Emergency department visit for the evaluation and management of a patient, usually the presenting problem(s) are of high severity and pose an immediate significant threat to life or physiologic function.	CPT-4	99285

MORTALITY ANALYSIS

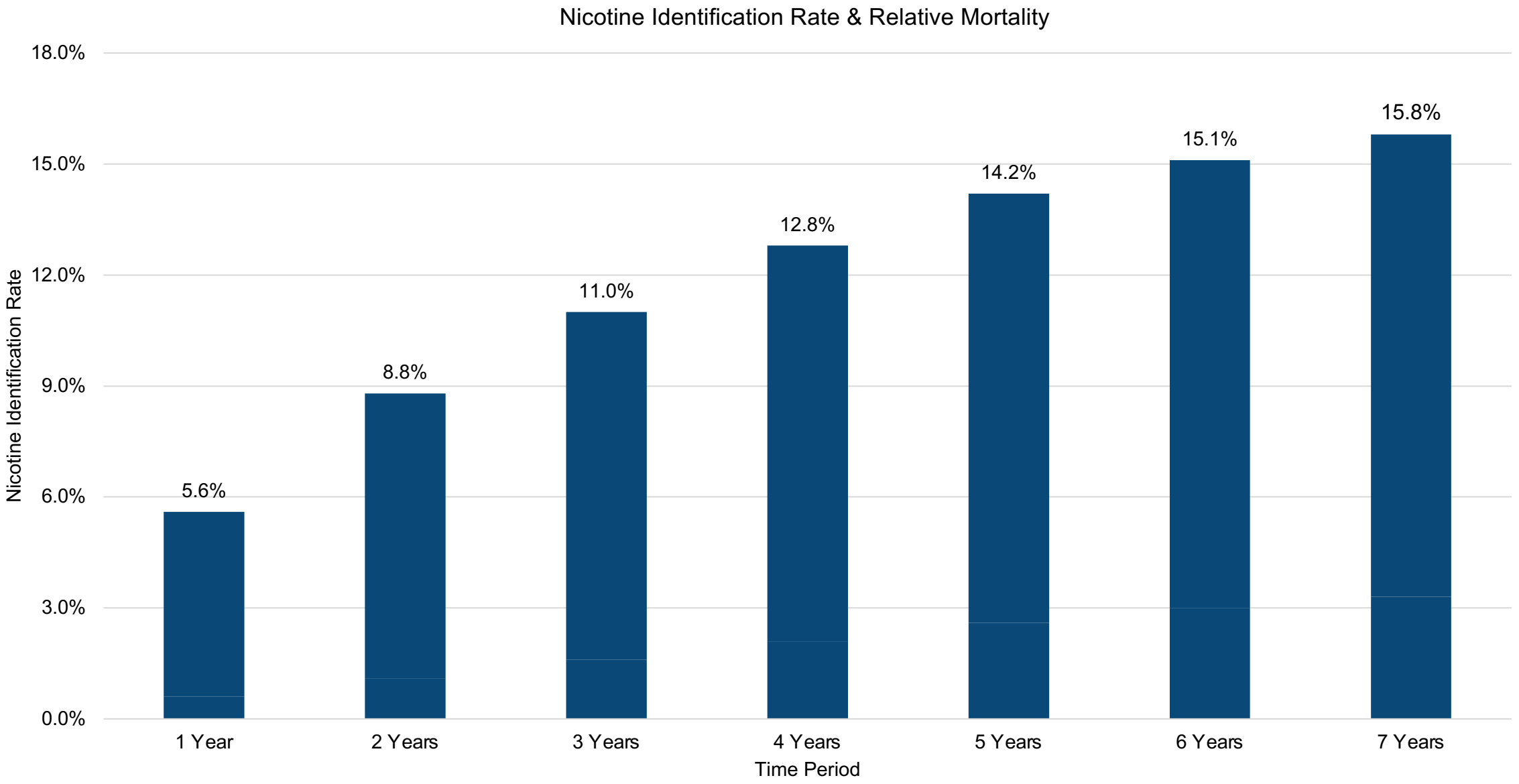
MILLIMAN'S MORTALITY STUDY IS A RICH SOURCE FOR INSIGHT.



NICOTINE USE IS PREDICTIVE OF HIGH MORTALITY.



NICOTINE USE INDICATES HIGH MORTALITY FOR MANY YEARS.



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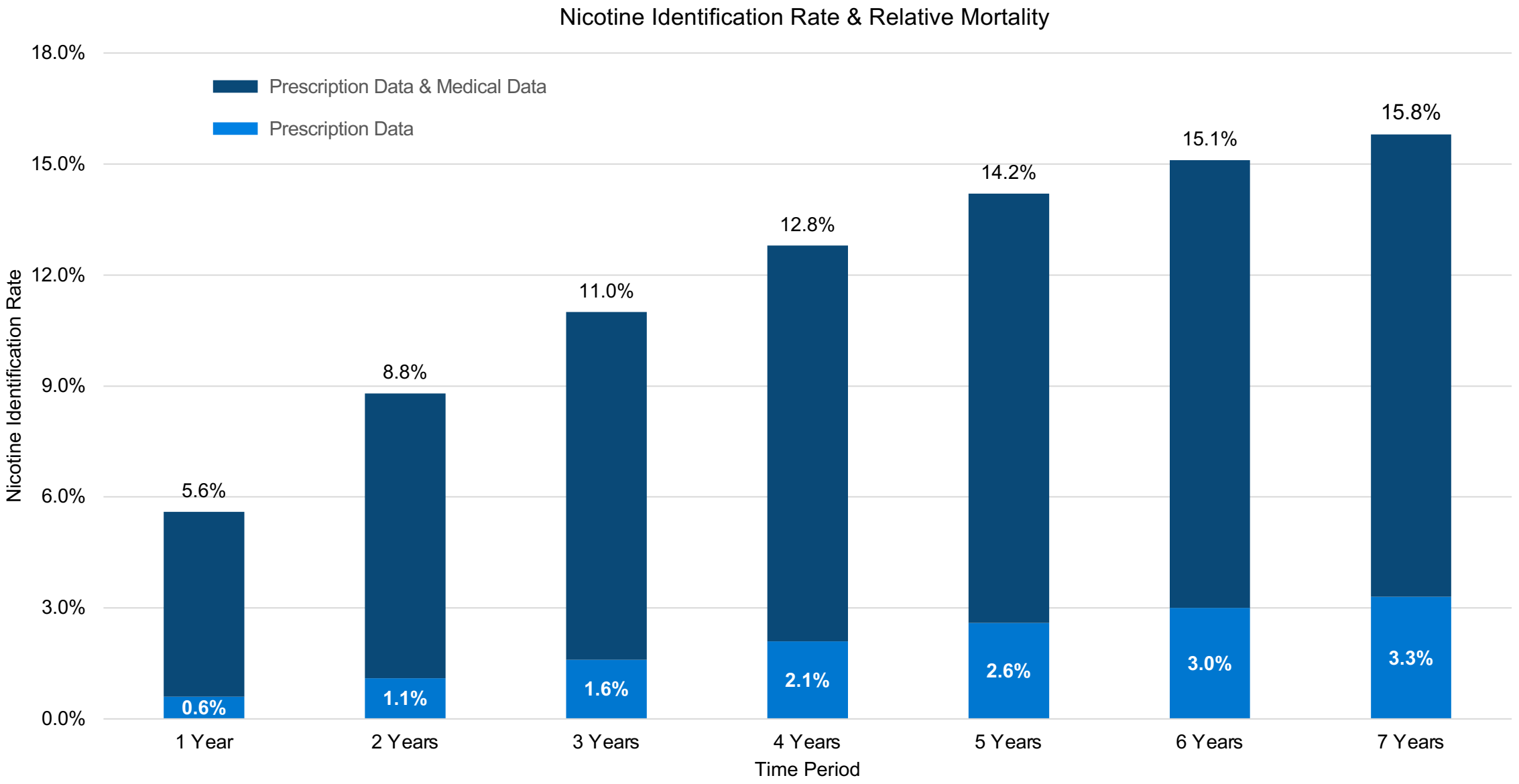

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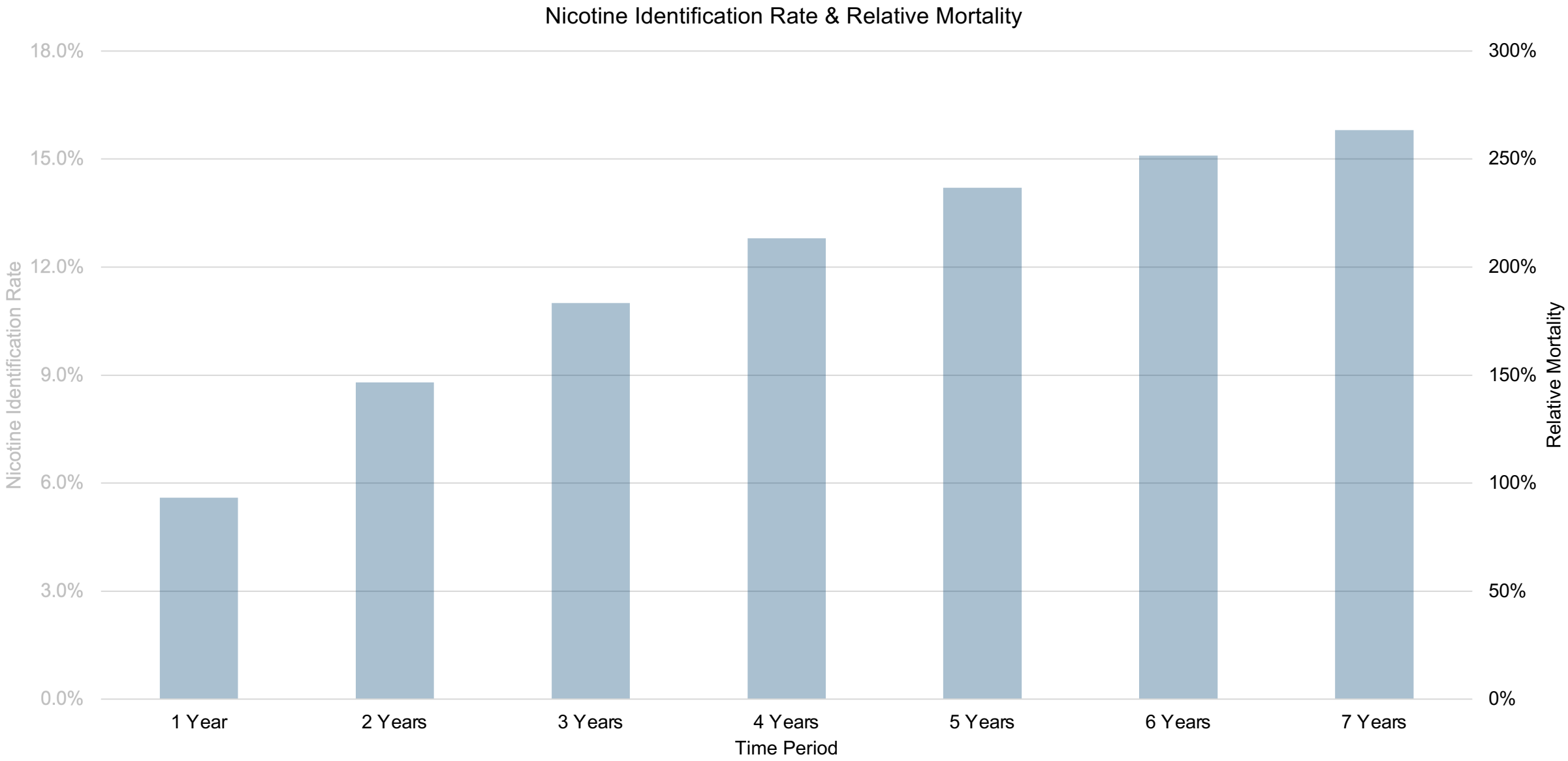

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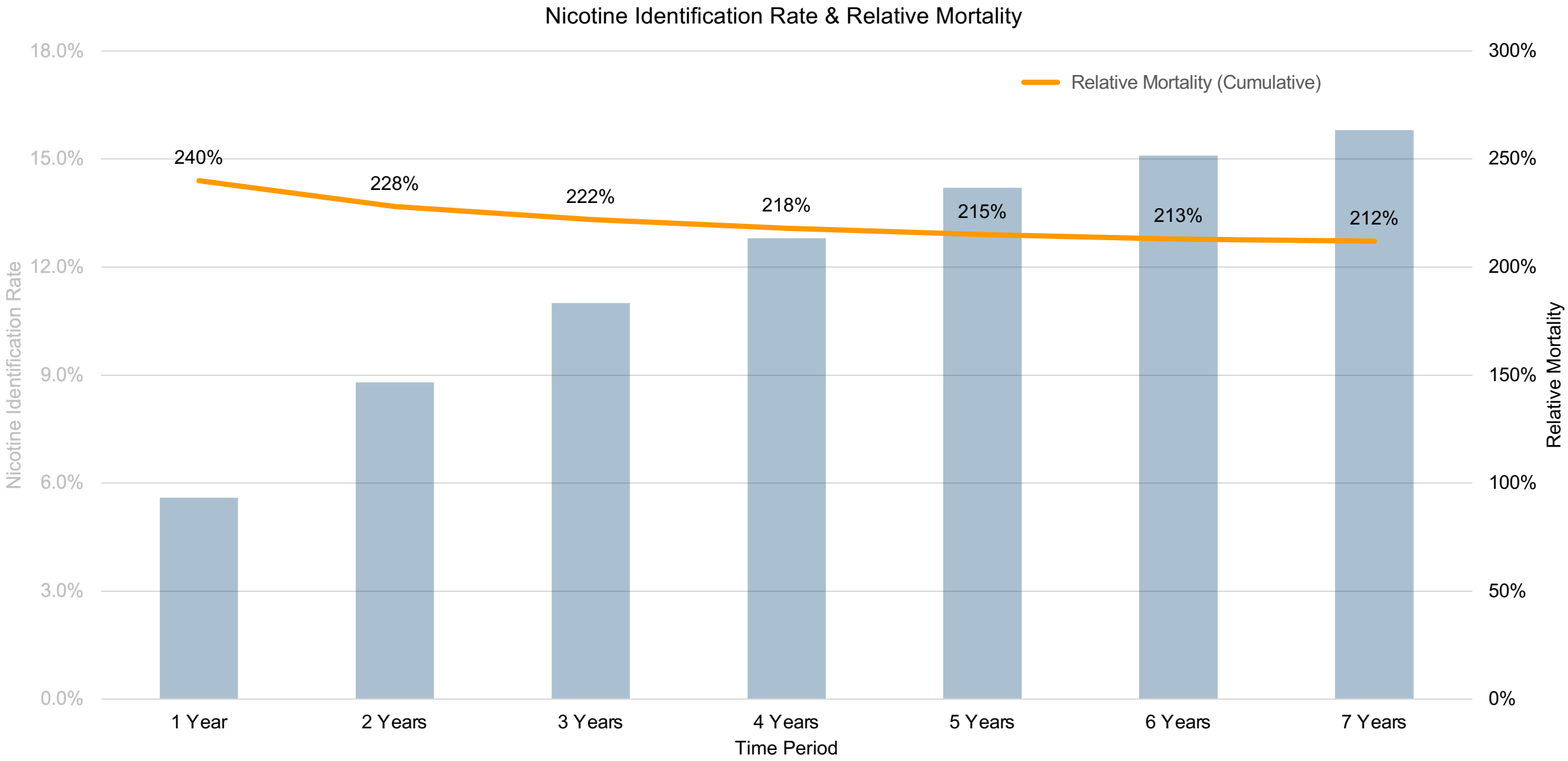

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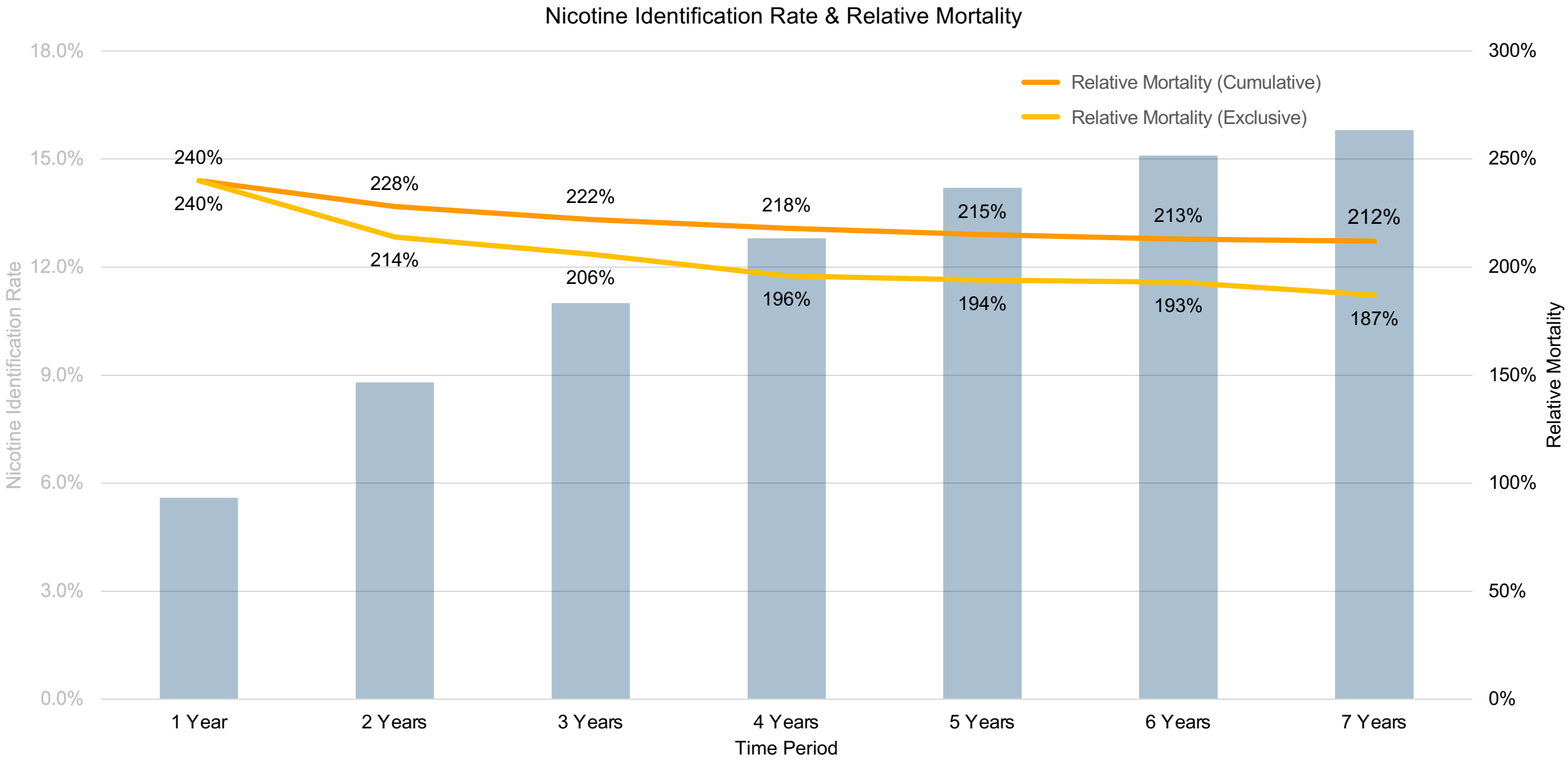
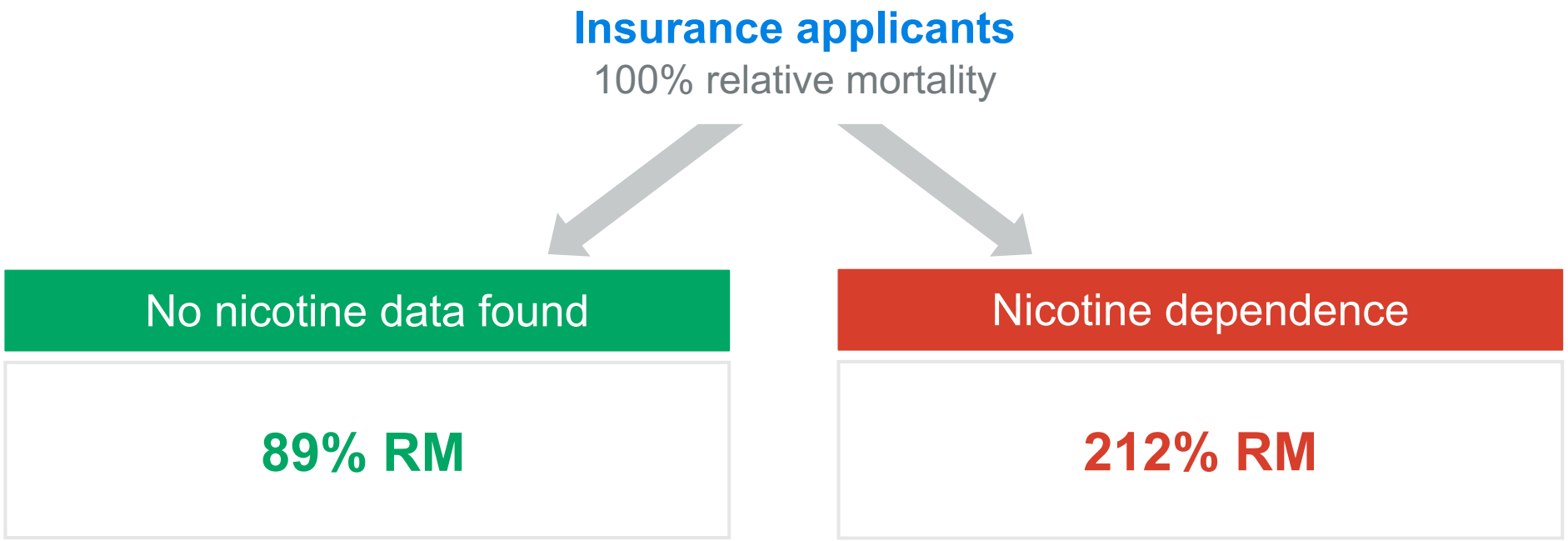


ALL NICOTINE CATEGORIES HAVE ELEVATED MORTALITY.



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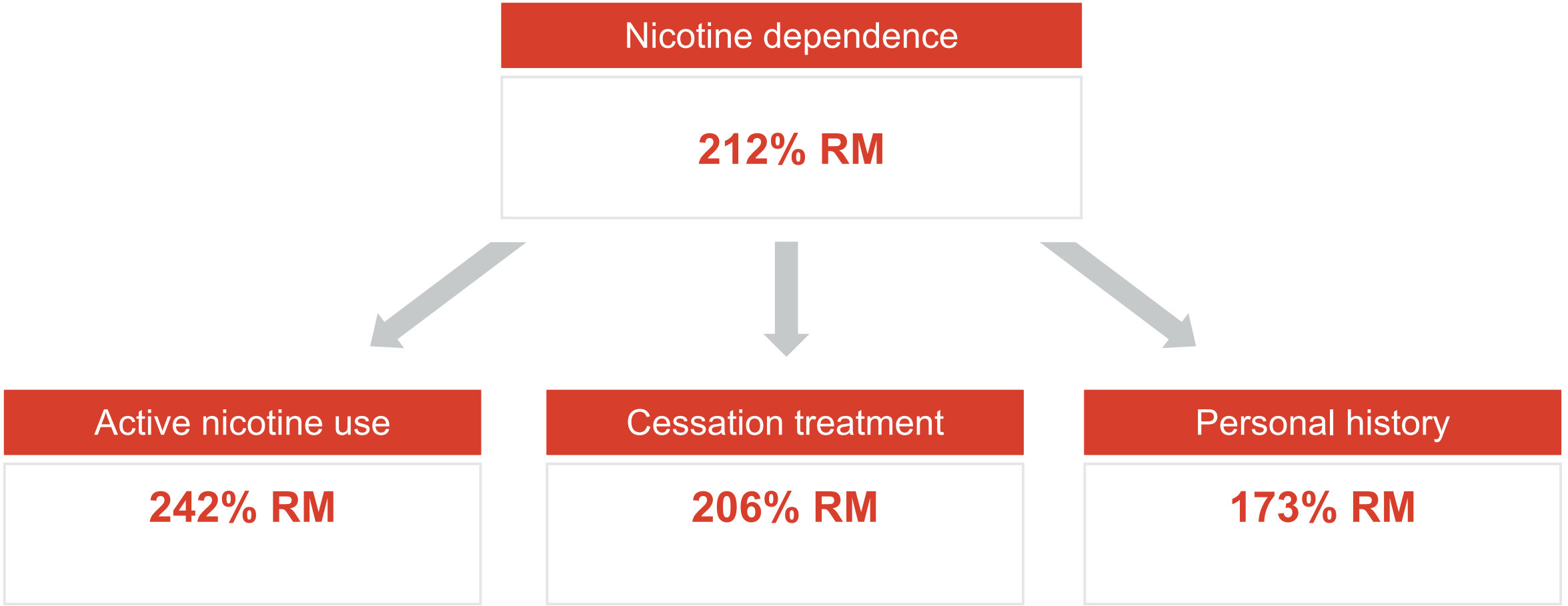

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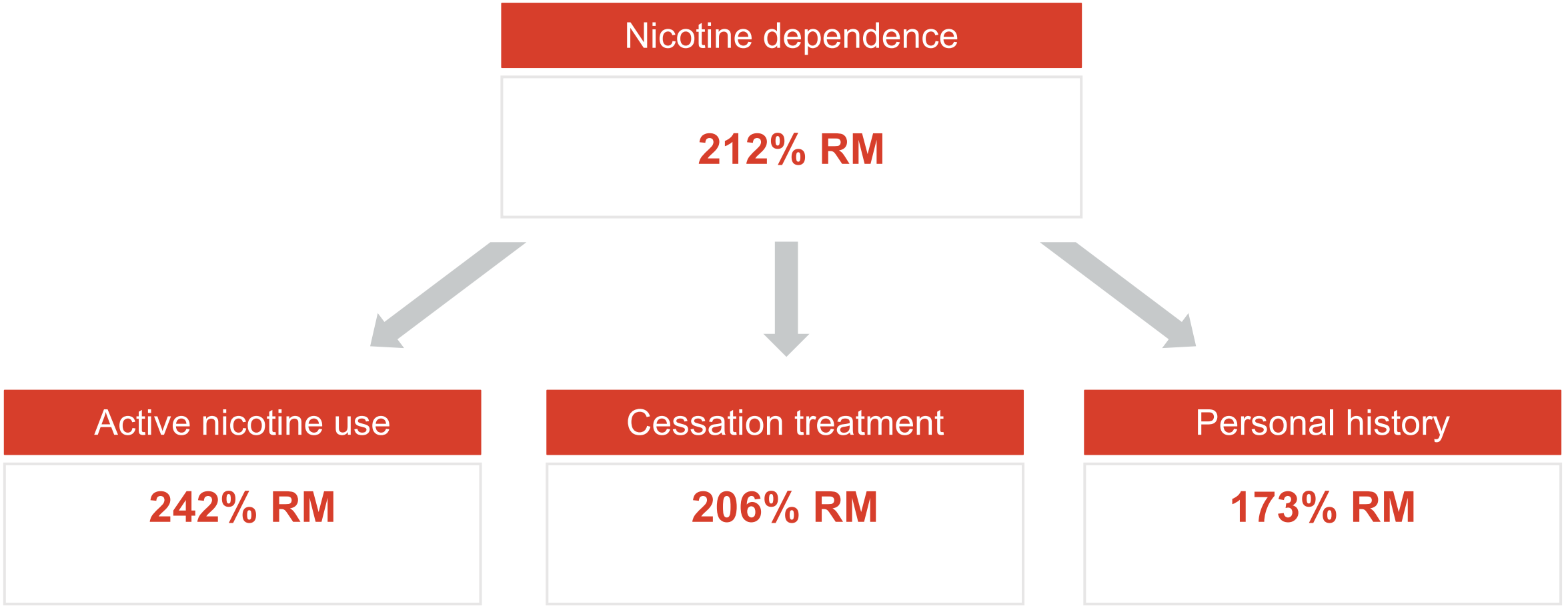

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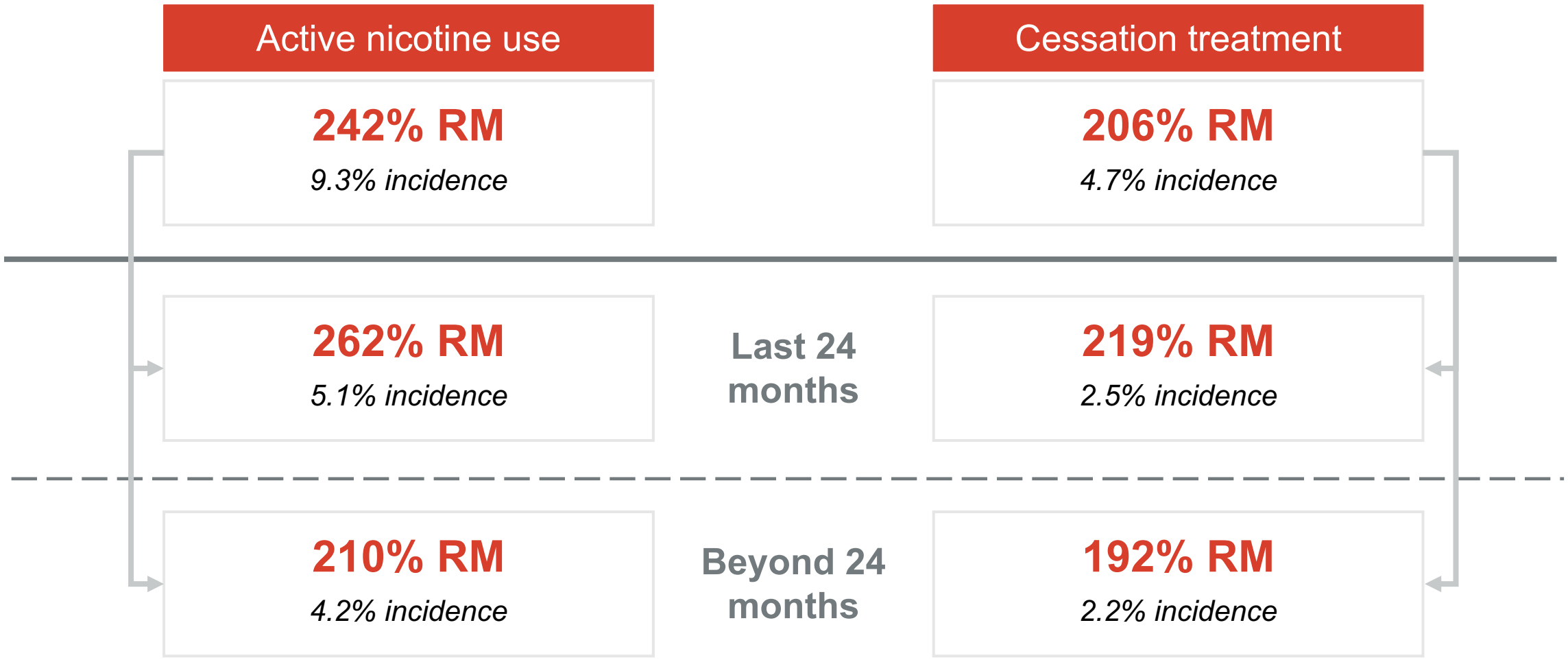
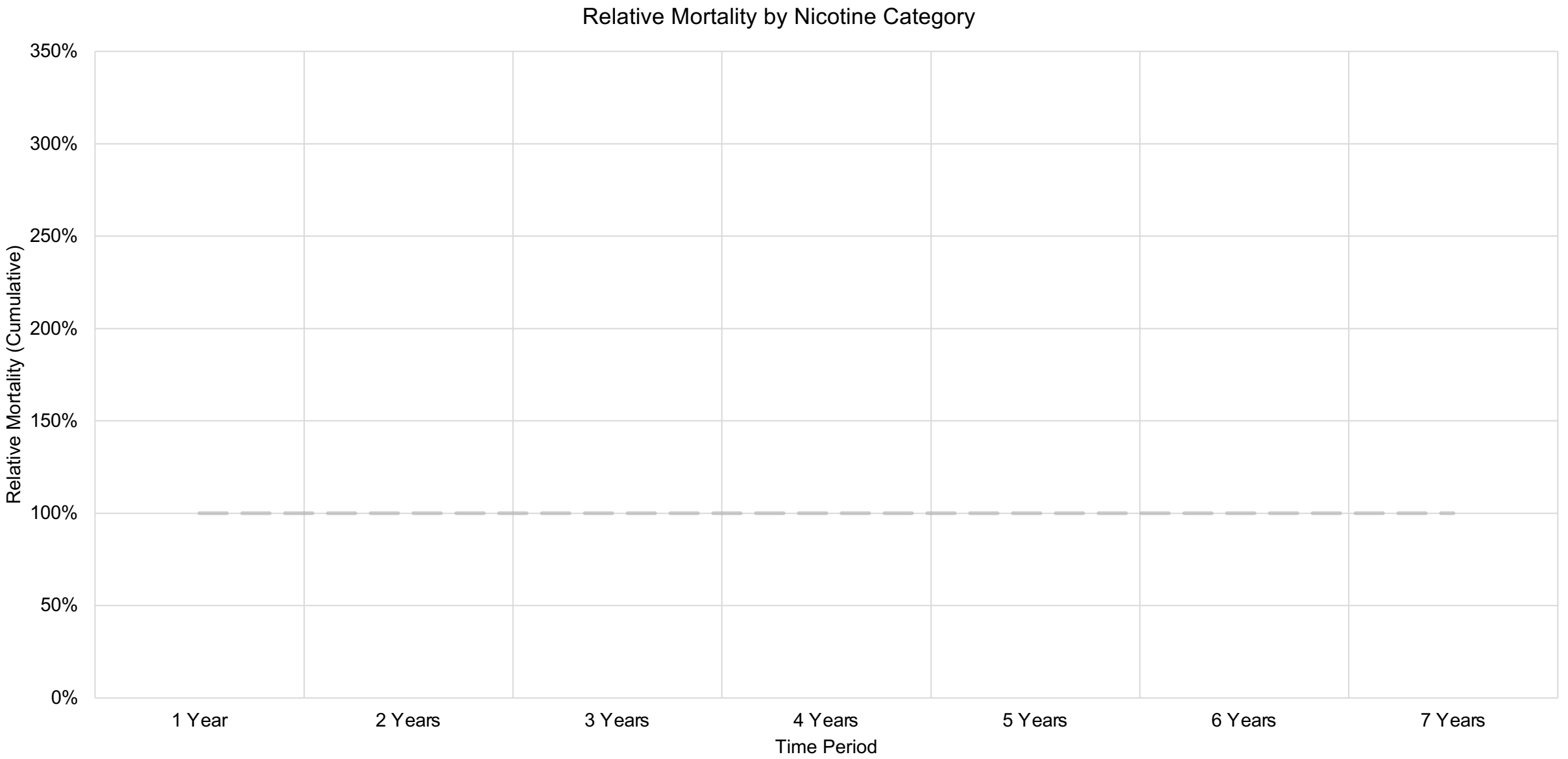


ALL HISTORIC NICOTINE USE IS IMPORTANT IN UNDERWRITING.



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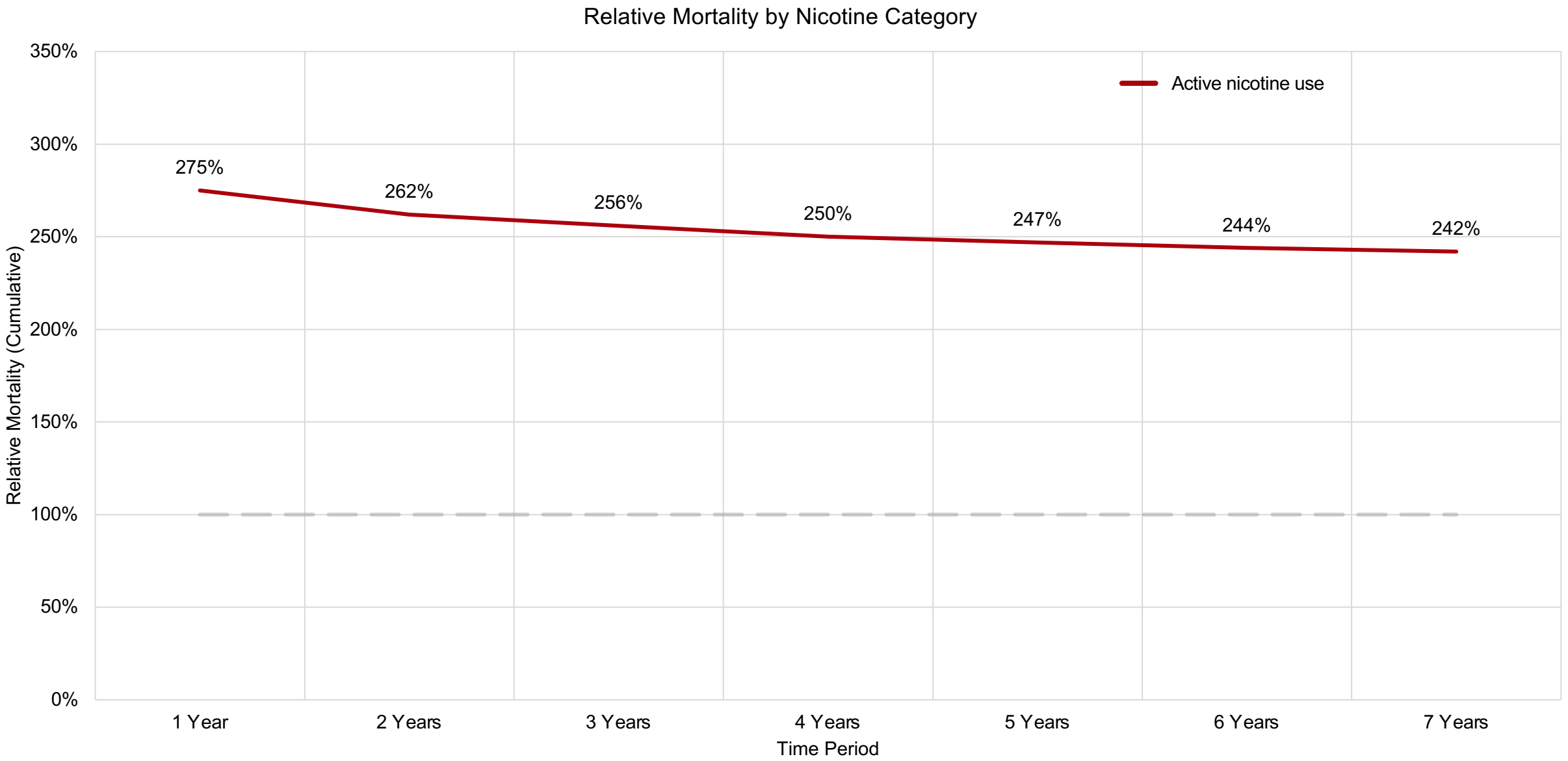

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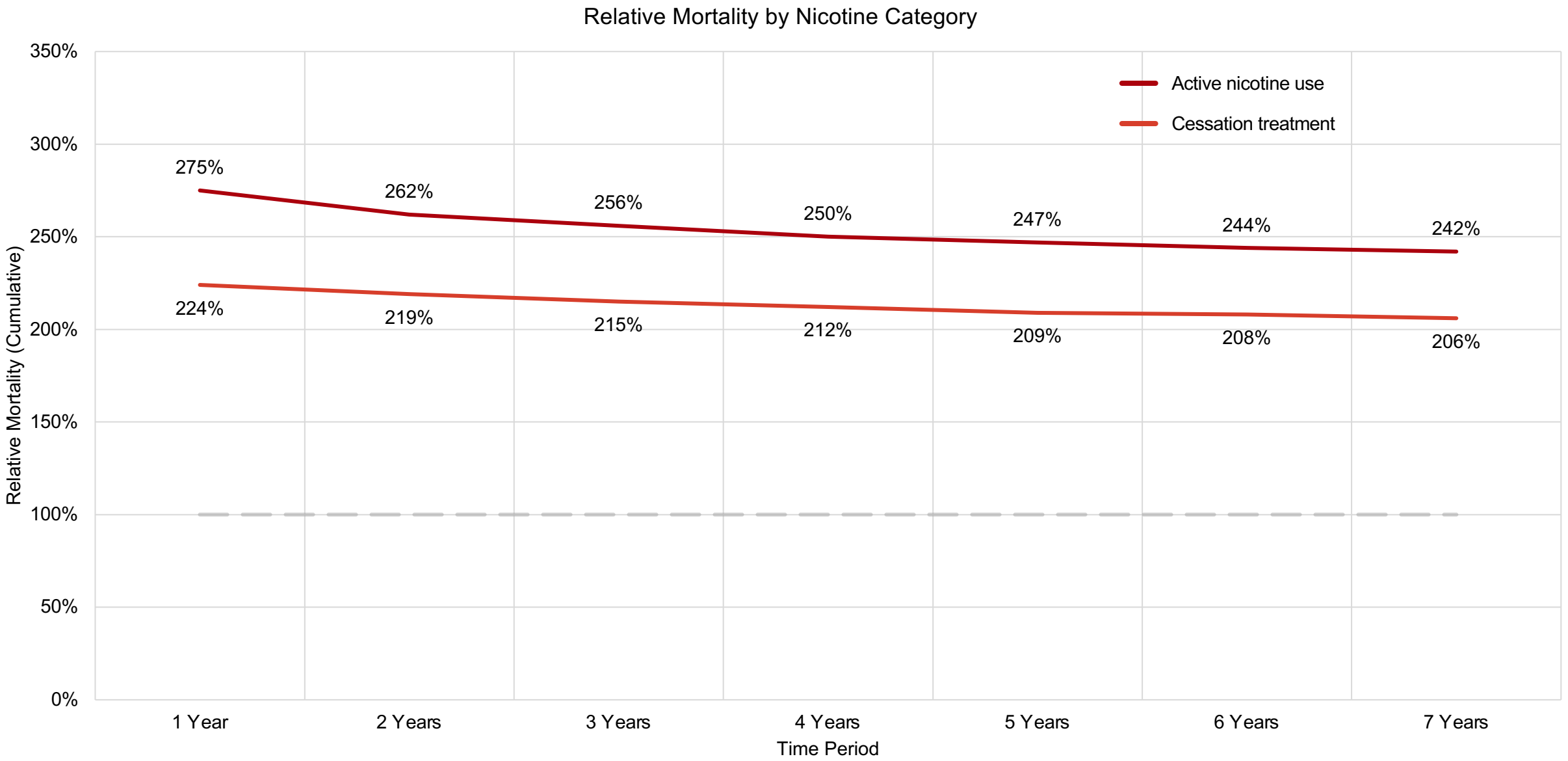
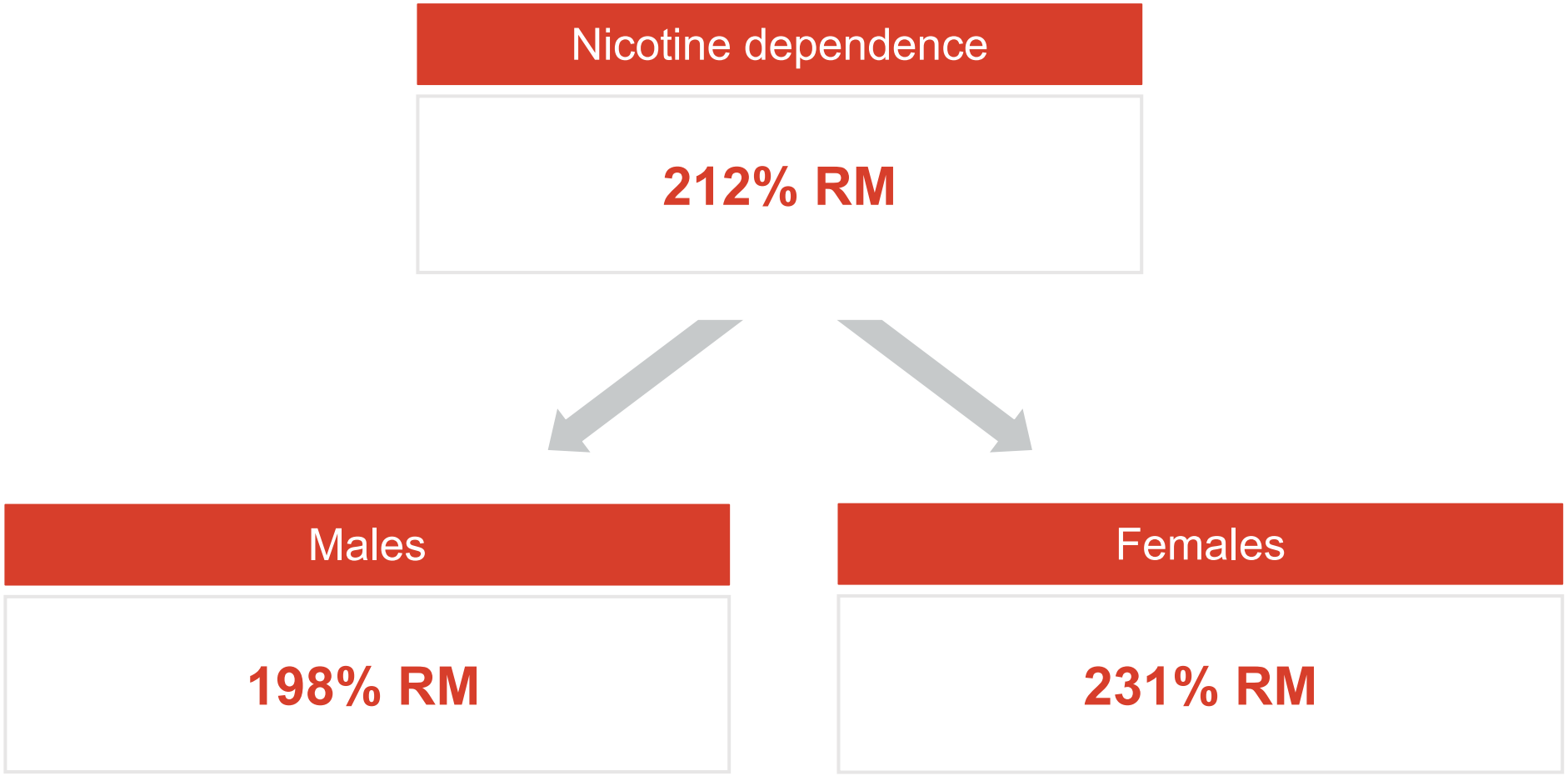
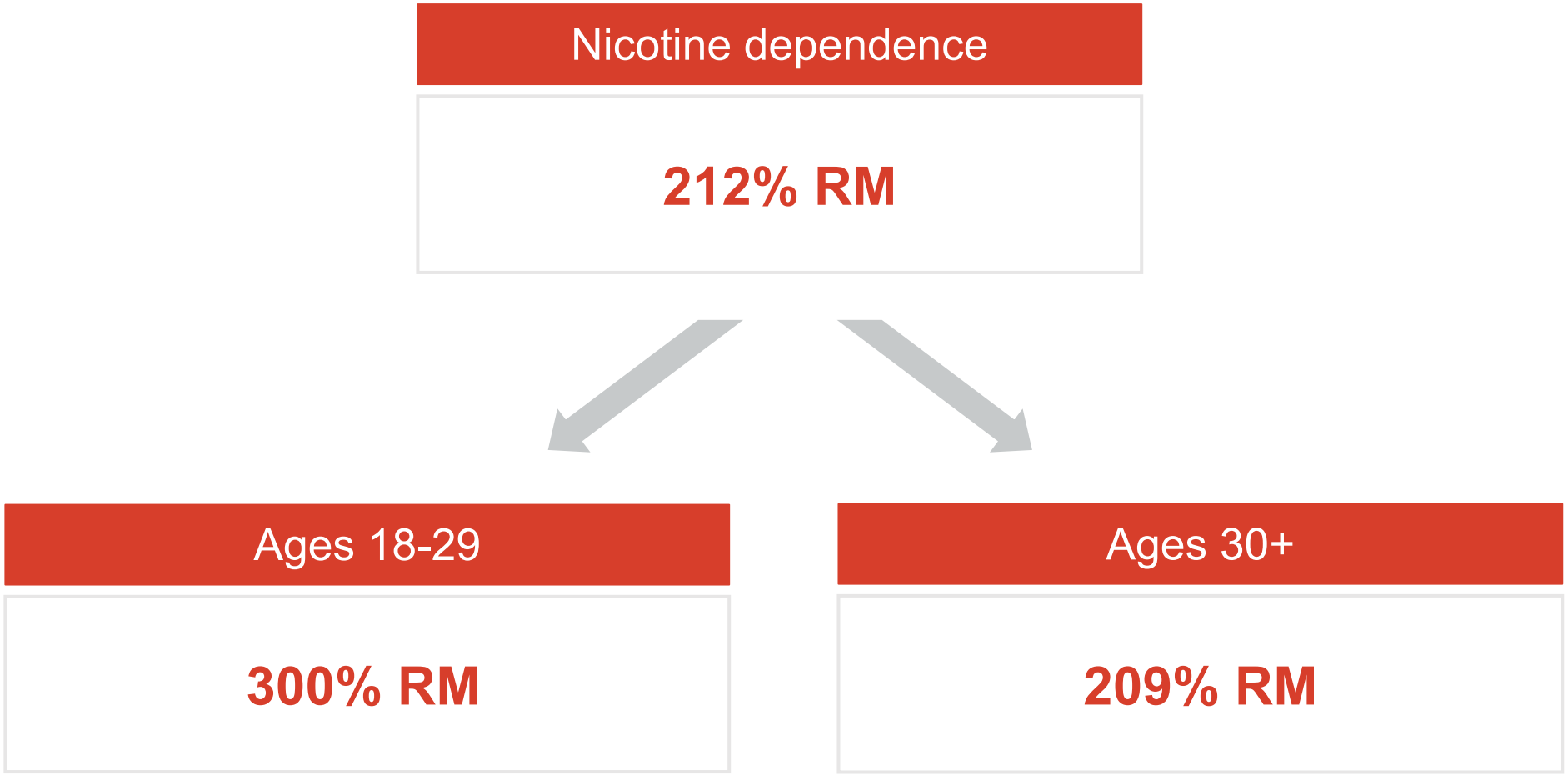


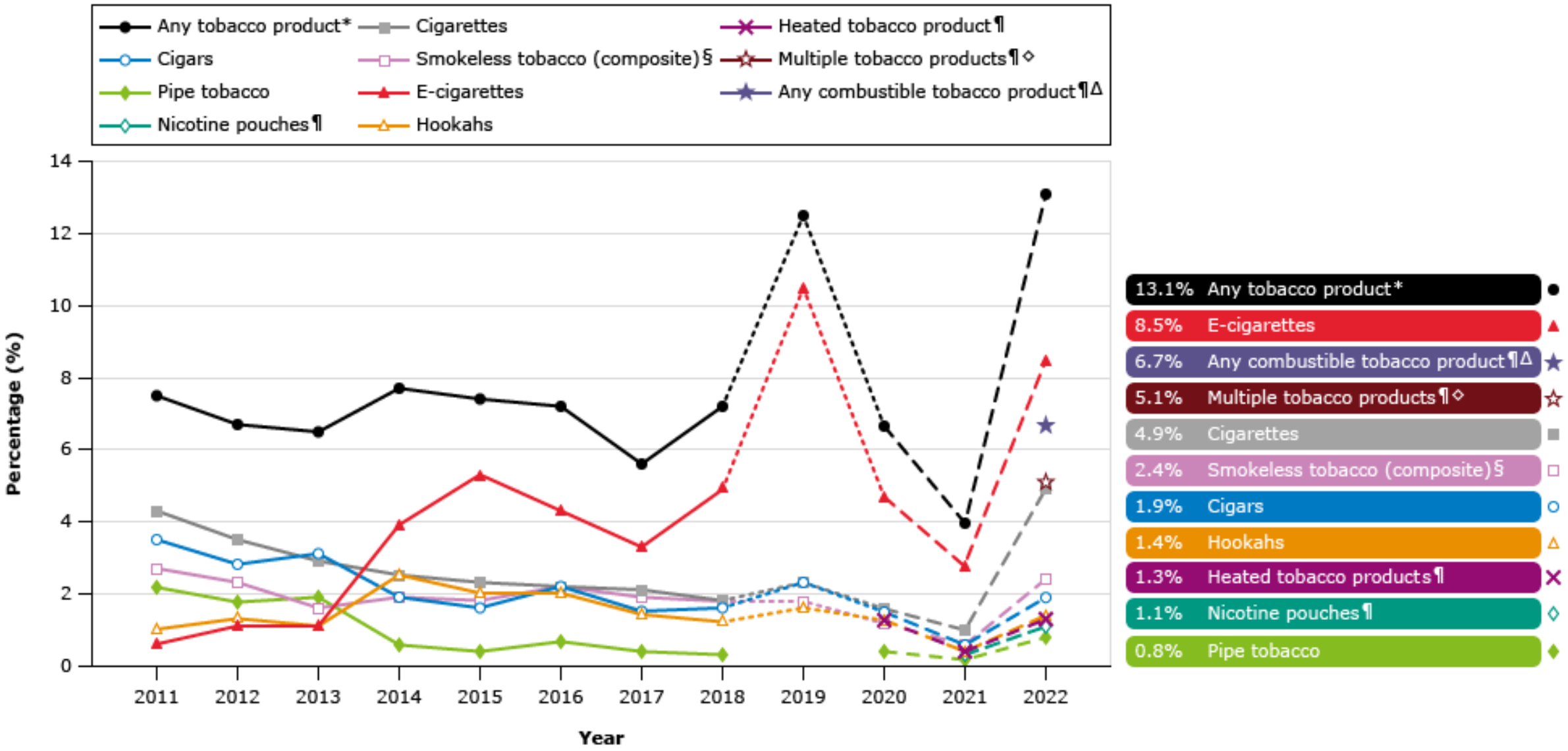
NICOTINE-DEPENDENT RELATIVE MORTALITY BY GENDER



NICOTINE-DEPENDENT RELATIVE MORTALITY BY AGE



VAPING ACTIVITY HAS SKYROCKETED IN RECENT YEARS



WHAT ABOUT VAPING AND E-CIGARETTES?

- Vaping is the act of inhaling vapor from an electronic cigarette, also know as a vape pen or vaporizer.
- E-cigarettes are battery-powered devices that heat a liquid, turning it into vapor that is then inhaled. The vaporization is activated by inhalation or pushing a button.
- The atomizer then heats and aerosolizes the liquid in the cartridge, creating an aerosol that emulates but is not tobacco smoke.
- The newest ”pod-mod” devices, often under the brand name of JUUL, resemble a USB flash drive. The small size and discreet appearance make it easy for the device to go unnoticed in school settings.

WHAT IS CONTAINED IN THE VAPOR?

- Nicotine, propylene or ethylene glycol, and flavorings
- Metals such as tin, lead, nickel, chromium, manganese and arsenic have been found in some e-cigarette liquids and aerosols
- Other compounds detected include tobacco-specific nitrosamines, carbonyl compounds, metals, volatile organic compounds, and phenolic compounds
- Vaping devices can be used to aerosolize tetrahydrocannabinol (THC) or cannabinoid (CBD) oils
- The nicotine content of the aerosolized liquids are commonly sold as 6 – 24 mg/L, although concentrations may exceed 36 mg/mL.

CONSEQUENCES OF VAPING

- In 2019, vitamin E acetate found in cartridges containing THC products were associated with EVALI (E-cigarette or vaping associated lung injury), with 2800 hospitalizations and 68 deaths.
- E-cigarette use has also been associated with the development of acute eosinophilic pneumonia.
- Although vaping has been assumed to be less consequential than cigarette smoking, there is concern that vaping in young people is associated with increased transition to cigarette smoking later in life.
- While not negligible, the exposure to passive e-cigarette vapor is less significant than exposure to cigarette smoke.

NOTABLE TRENDS IN USE OF VAPING

Between 2018 to 2020, the prevalence of regular e-cigarette use among young adults (ages 18-24) increased from 7.6% to 9.4%.

Between 2013 to 2018, national surveys of middle and high school students in the US revealed an upward trend in e-cigarette use over a past 30-day use, with the greatest increase being in e-cigarette use.

NICOTINE DEPENDENCE HAS A LASTING IMPACT ON HEALTH.

Leading cause of preventable disease, disability, and death in the U.S.

>480K

Low successful quit rates and high relapse rates

47%

Leads to elevated mortality for many years

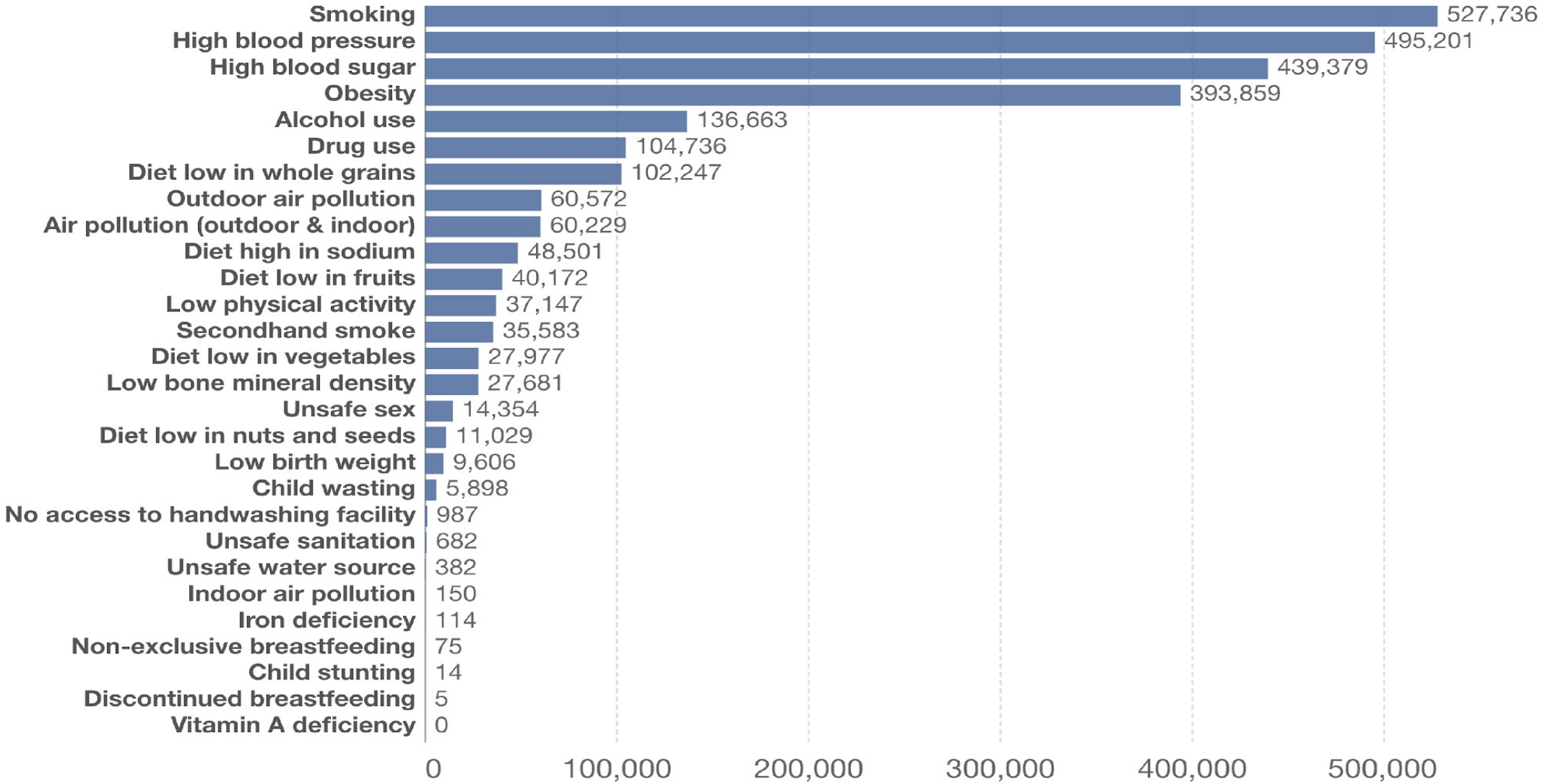
212%

Any history with nicotine dependence has underwriting significance

15.8%

Number of deaths by risk factor, United States, 2019

Total annual number of deaths by risk factor, measured across all age groups and both sexes.



Source: IHME, Global Burden of Disease (2019)

QUESTIONS?

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FOOTNOTES

1. Smoking & Tobacco Use. Centers for Disease Control and Prevention. Updated November 10, 2022.Accessed November 24, 2022. https://www.cdc.gov/tobacco/data_statistics/index.htm.
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FOOTNOTES

9. Haass M, Kübler W. Nicotine and sympathetic neurotransmission. *Cardiovasc Drugs Ther*. 1997;10(6):657-665. doi:10.1007/BF00053022.
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11. What to Tell Your Patients About Smoking. Centers for Disease Control and Prevention. Accessed January 4, 2023. https://www.cdc.gov/tobacco/data_statistics/sgr/2010/clinician_sheet/pdfs/clinician.pdf.

THANK YOU