



MONDAYS WITH
D R **MARK** & D R **MICHAEL**

Monday, August 19, 2024 | 1:00 – 1:45PM

TOPIC #29

The Power of Prevention:
How 40% of U.S. Cancer Cases Could Be Avoided



Guest speakers:



Farhad Islami, MD, PhD
Senior Scientific Officer
American Cancer Society



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American Cancer Society in New York



MONDAYS WITH
D^R MARK & D^R MICHAEL

The Power of Prevention: How Some Cancer Cases Could Be Avoided



August 19th, 2024

Today's Topics

Please share questions in the chat, and someone from the American Cancer Society will address your questions!

1

Who We Are

2

What We Do

3

How to Get Involved

4

The Power of Prevention

5

Questions & Answers



Our Vision:

End cancer as we know it, for everyone.

Acabar con el cáncer como lo conocemos, por el bien de todos.

Our Mission:

To improve the lives of people with cancer and their families through advocacy, research, and patient support to ensure everyone has an opportunity to prevent, detect, treat, and survive cancer.

Mejorar las vidas de las personas con cáncer y sus familias por medio de política pública, investigación, y apoyo a los pacientes, para asegurar que todos tengamos la oportunidad de prevenir, detectar, tratar y sobrevivir al cáncer.

**The American Cancer Society exists
because the burden of cancer is
unacceptably high.**

Problem to Solve:

The National Burden of Cancer (USA)



Estimated new cases:
>2M new cases/year



Estimated deaths:
>600,000 new deaths/year



2024 ACS Cancer Statistics Report

<https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2024/2024-cancer-facts-and-figures-acf.pdf>

3-Pronged Approach to Improving the Lives of Cancer Patients and Families



Patient-centric strategy, grounded in equitable access to cancer care for all

Discovery

\$450M+
in grants

Largest private, non-profit funder of cancer research in the US

Advocacy

50 states
the District of Columbia
Puerto Rico & Guam

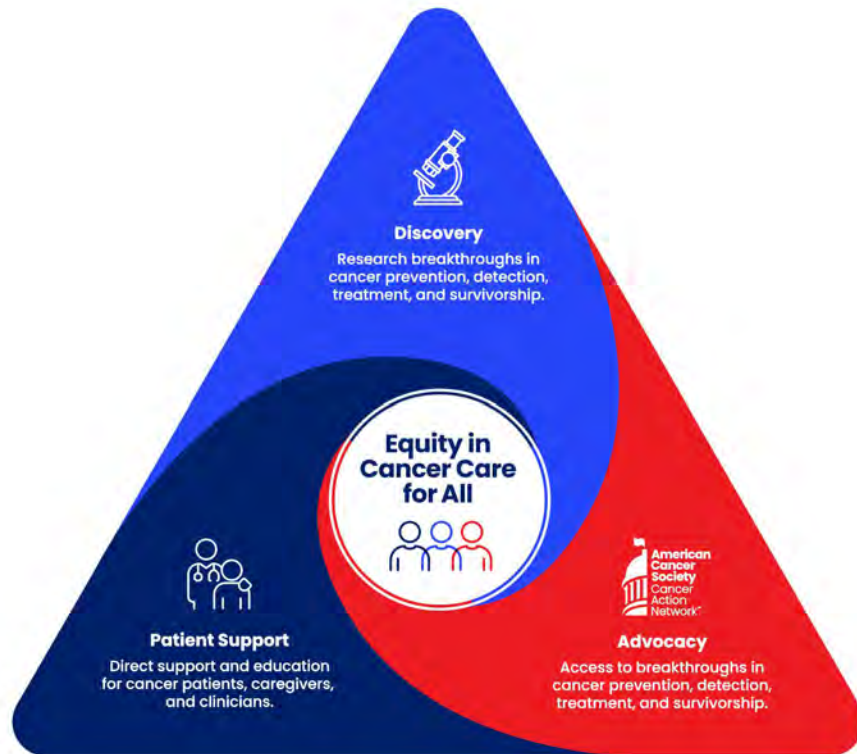
Advocacy presence at every level of government

Patient Support

79M+
Lives touched
per year

Direct patient support* in prevention, screening, lodging, transportation, navigation, survivorship, education

* Patient support programs and services touch 21,000 communities within the U.S. and its territories, or 71% of zip codes.



Programs and Resources Available for Employees

**24/7 access to
cancer
information**

**Free rides and
lodging
during
cancer
treatment**



**Connect with
other patients,
survivors, and
caregivers**

**Find cancer
screening
resources and
locations**





Get Involved with American Cancer Society



- 1 Join an Event**
Attend Relay for Life, Making Strides Against Breast Cancer, endurance events, galas, balls, and parties, or golf tournaments as an individual or team.
- 2 Engage Your Business**
Join CEOs Against Cancer, become a sponsor, or provide opportunities for employees to come together in the fight against cancer.
- 3 Become a Volunteer**
Volunteer to drive patients to and from treatment appointments, help with Hope Lodge communities, or volunteer at an event.
- 4 Be an Advocate**
Join ACS CAN and use your passion for politics to help enact laws and policies that will make cancer a top national priority.
- 5 Participate in Virtual Challenges**
Bike, swim, walk, or take photos in nationwide virtual challenges that change monthly.

The Path to Engaging 100,000 VOICES of Black Women



VOICES
OF BLACK WOMEN

Enrollment is NOW OPEN in all VOICES states!

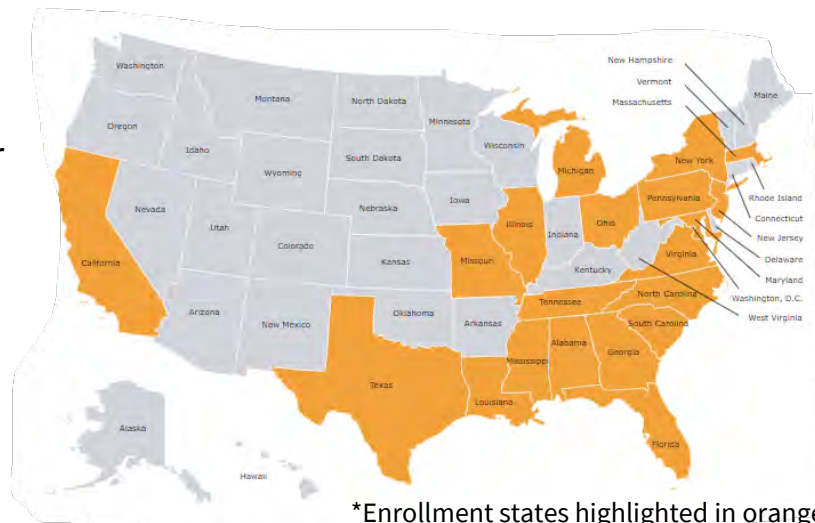


VOICES of Black Women will recruit:

- Black women between the ages of 25-55 years
- No history of cancer diagnosis (except basal or squamous skin cancer)
- Live anywhere in 20 enrollment states or D.C.

After providing consent, participation involves:

- ✓ Completing an entirely online and self paced survey (~an hour of time) at the start of the study
- ✓ Completing additional surveys (up to 30 minutes each) twice a year
- ✓ Invitations to provide additional, optional data collection over time



*Enrollment states highlighted in orange



Visit voices.cancer.org to learn more and JOIN today!

Cancer cases and deaths attributable to potentially modifiable risk factors

**Farhad Islami, MD PhD
Senior Scientific Director
American Cancer Society**

8/19/2024

Conflicts of interest

- None

Overview

- 1 **Evaluated risk factors and cancers**
- 2 **Number and proportion of cancers attributable to potentially modifiable risk factors**
- 3 **Implication**
- 4 **Limitation**
- 5 **Conclusions**

Evaluated risk factors and cancers

CA Cancer J Clin. 2024;1–28.

Proportion and number of cancer cases and deaths attributable to potentially modifiable risk factors in the United States, 2019

DOI: 10.3322/caac.21858

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Evidence on risk factors and associated risk factors

- **Smoking, alcohol, excess body weight, infections**

- International Agency for Research on Cancer (IARC)

- **Dietary factors**

- World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR)

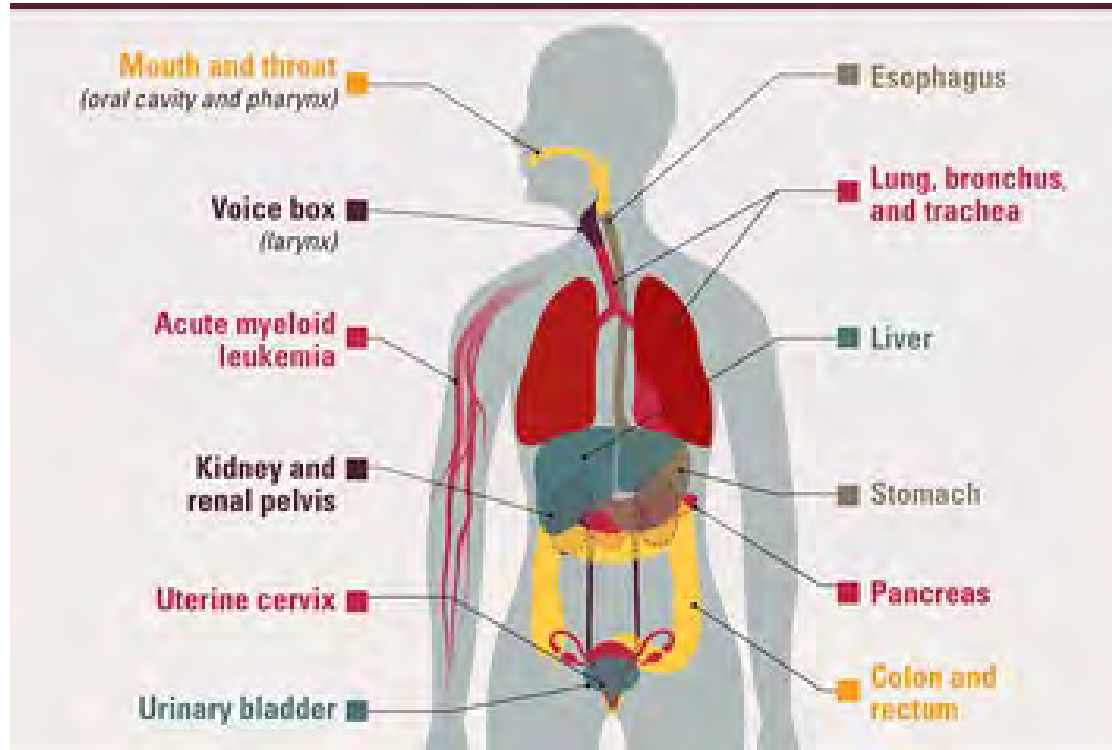
- **Physical inactivity**

- U.S. Department of Health and Human Services. 2018 Physical Activity Guidelines Advisory Committee Scientific Report

Risk factor	Cancer type (International Classification of Diseases, 10th revision codes) ^a
Cigarette smoking (IARC Working Group 2012 ⁷)	Oral cavity (C00–C08); pharynx (C09–C14); esophagus (C15); stomach (C16); colorectum (C18–C20, C26.0); liver (C22.0, C22.2–C22.4, C22.7, C22.9); pancreas (C25); nasal cavity, paranasal sinus (C30.0–C31); larynx (C32); trachea (C33); lung, bronchus (C34); cervix uteri (C53); ovary (C56) [mucinous type only]; kidney, renal pelvis (C64–C65); ureter (C66); urinary bladder (C67); acute myeloid leukemia (C92.0, C92.4–C92.6, C92.8, C94.0, C94.2)
Second-hand smoke exposure (IARC Working Group 2012 ⁷)	Lung, bronchus (C34) [only among never-smokers and former-smokers]
Excess body weight (Lauby-Secretan 2016 ⁹)	Esophagus (C15) [adenocarcinoma only]; stomach, cardia only (C16.0); colorectum (C18–C20, C26.0); liver (C22.0, C22.2–C22.4, C22.7, C22.9); gallbladder (C23); pancreas (C25); female breast (C50) [postmenopausal cancers only ¹¹]; corpus uteri (C54–C55); ovary (C56); kidney, renal pelvis (C64–C65); thyroid (C73); myeloma (C90.0, C90.2, 90.3)
Alcohol consumption (IARC Working Group 2012 ⁷)	Oral cavity (C00–C08); pharynx (C09–C14); esophagus (C15) [squamous cell carcinoma only]; colorectum (C18–C20, C26.0); liver (C22.0) [hepatocellular carcinoma only]; larynx (C32); female breast (C50)
Dietary factors	
Red meat consumption (WCRF/AICR 2018 ¹⁰)	Colorectum (C18–C20, C26.0)
Processed meat consumption (Bouvard 2015, ⁸ WCRF/AICR 2018 ¹⁰)	Colorectum (C18–C20, C26.0)
Low fruit and nonstarchy vegetable consumption (WCRF/AICR 2018 ¹⁰)	Aerodigestive organs, aggregated, including oral cavity, pharynx, esophagus, larynx (C00–C15, C32)
Low dietary fiber consumption (WCRF/AICR 2018 ¹⁰)	Colorectum (C18–C20, C26.0)
Low dietary calcium consumption (WCRF/AICR 2018 ¹⁰)	Colorectum (C18–C20, C26.0)
Physical inactivity (U.S. Department of Health and Human Services 2018 ²)	Esophagus (C15) [adenocarcinoma only]; stomach (C16); colon excluding rectum (C18, C26.0); female breast (C50); corpus uteri (C54–C55); kidney, renal pelvis (C64–C65); urinary bladder (C67)
Ultraviolet radiation (IARC Working Group 2012 ⁶)	Melanoma of the skin (C43)
Infections	
Epstein-Barr virus (IARC Working Group 2012 ⁵)	Nasopharynx (C11); Hodgkin lymphoma (C81)
<i>Helicobacter pylori</i> (IARC Working Group 2012 ⁵)	Stomach, noncardia only (C16.1–C16.6)
Hepatitis B virus (IARC Working Group 2012 ⁵)	Liver (C22.0, C22.2–C22.4, C22.7, C22.9)
Hepatitis C virus (IARC Working Group 2012 ⁵)	Liver (C22.0, C22.2–C22.4, C22.7, C22.9); non-Hodgkin lymphoma (C82–C85, C96.3)
Human herpes virus type 8 (Kaposi sarcoma herpes virus; IARC Working Group 2012 ⁵)	Kaposi sarcoma (C46)
Human immunodeficiency virus (IARC Working Group 2012 ⁵)	Anus (C21); Kaposi sarcoma (C46); cervix uteri (C53); Hodgkin lymphoma (C81); non-Hodgkin lymphoma (C82–C85, C96.3)
Human papillomavirus (IARC Working Group 2012 ⁵)	Oral cavity excluding lip and base of tongue (C02–C06); oropharynx, tonsils, base of tongue (C01, C09–C10); anus (C21); vulva (C51); vagina (C52); cervix uteri (C53); penis (C60)

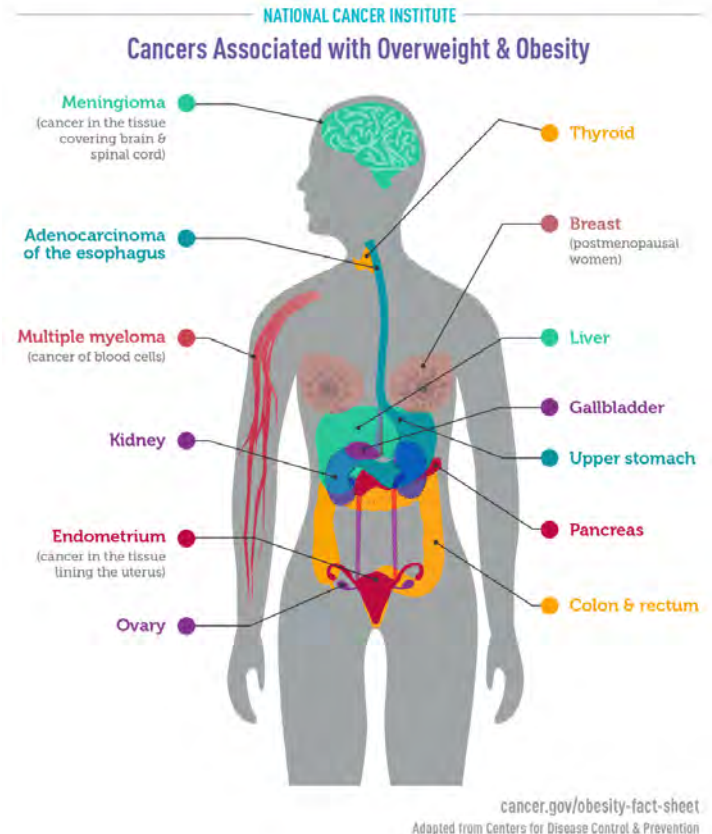
Cancers associated with cigarette smoking

- Oral cavity
 - Pharynx
 - Esophagus
 - Stomach
 - Colorectum
 - Liver
 - Pancreas
 - Nasal cavity, paranasal sinus
 - Larynx
 - Lung, bronchus, trachea
 - Cervix uteri
 - Ovary [mucinous type only]
 - Kidney, renal pelvis, ureter
 - Urinary bladder
 - Acute myeloid leukemia
- Second-hand smoke exposure
 - Lung, bronchus [only among never-smokers and former-smokers]



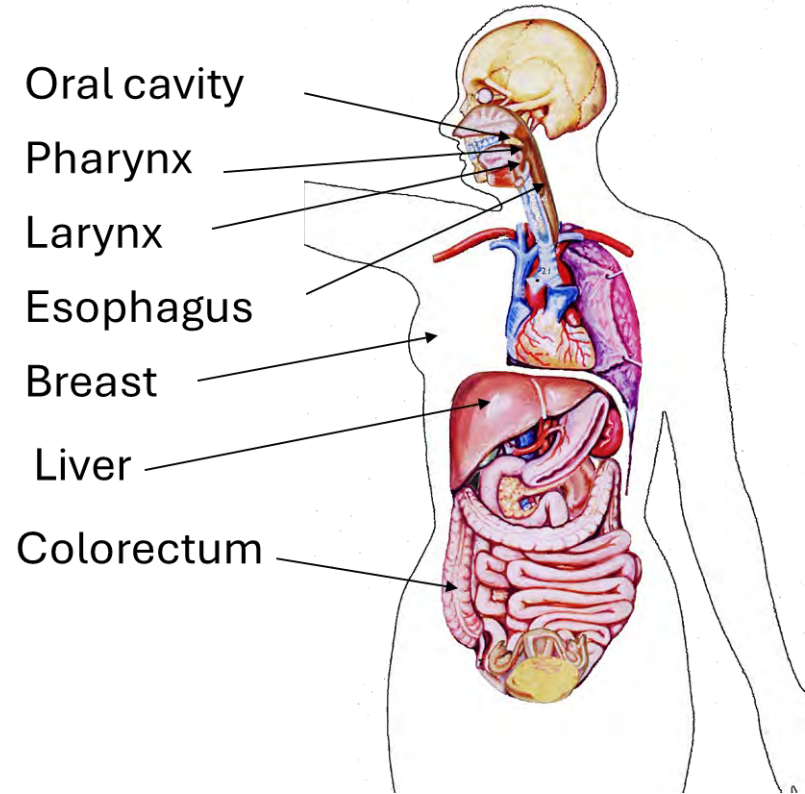
Cancers associated with **excess body weight**

- Esophagus [adenocarcinoma only]
 - Stomach [cardia only]
 - Colorectum
 - Liver
 - Gallbladder
 - Pancreas
 - Female breast [postmenopausal cancers only]
 - Corpus uteri
 - Ovary
 - Kidney, renal pelvis
 - Thyroid
 - Myeloma
-
- Not included
 - Meningioma



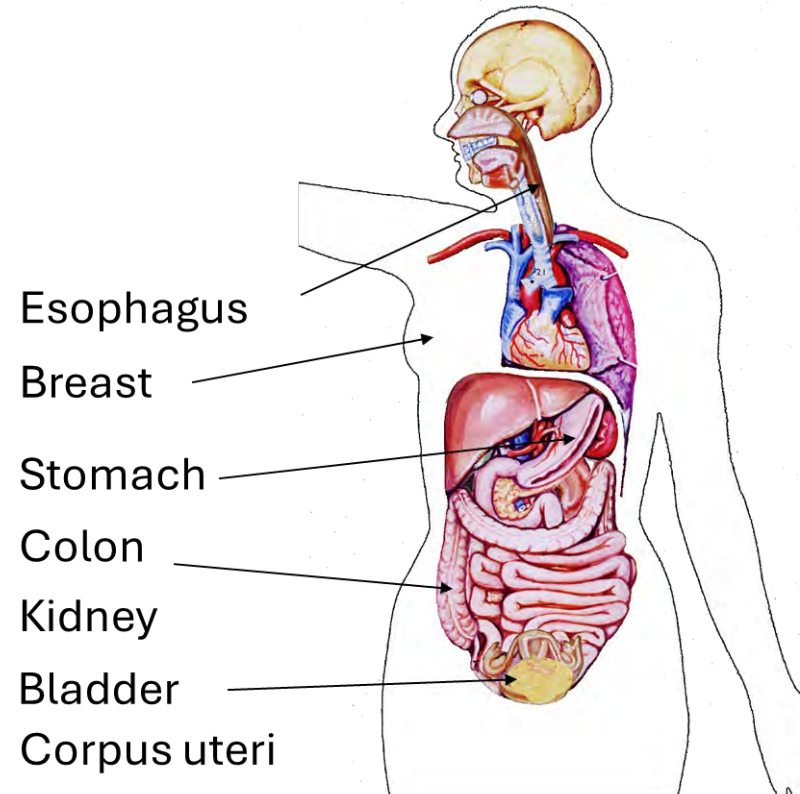
Cancers associated with alcohol consumption

- Oral cavity
- Pharynx
- Esophagus [squamous cell carcinoma only]
- Colorectum
- Liver [hepatocellular carcinoma only]
- Larynx
- Breast (female)



Cancers associated with **physical inactivity**

- Esophagus [adenocarcinoma only]
- Stomach
- Colon, excluding rectum
- Breast (female)
- Corpus uteri
- Kidney, renal pelvis
- Urinary bladder



Cancers associated with dietary factors

Dietary factor	Cancer
Red meat consumption	Colorectum
Processed meat consumption	Colorectum
Low fruit and non-starchy vegetable consumption	Aerodigestive organs, aggregated, including oral cavity, pharynx, esophagus, larynx
Low dietary fiber consumption	Colorectum
Low dietary calcium consumption	Colorectum

Cancers associated with infections

Dietary factor	Cancer
Epstein-Barr virus	Nasopharynx; Hodgkin lymphoma
<i>Helicobacter pylori</i>	Stomach [non-cardia only]
Hepatitis B virus	Liver
Hepatitis C virus	Liver; non-Hodgkin lymphoma
Human herpes virus type 8 (Kaposi sarcoma herpes virus)	Kaposi sarcoma
Human immunodeficiency virus (HIV)	Anus; Kaposi sarcoma; cervix uteri; Hodgkin lymphoma; non-Hodgkin lymphoma
Human papillomavirus (HPV)	Oral cavity excluding lip and base of tongue; oropharynx, tonsils, base of tongue; anus; vulva; vagina; cervix uteri; penis

Not included: *Helicobacter pylori* (low-grade B-cell mucosa-associated lymphoid-tissue gastric lymphoma), human herpes virus type 8 (primary effusion lymphoma), HIV (cancer of the conjunctiva of the eye).

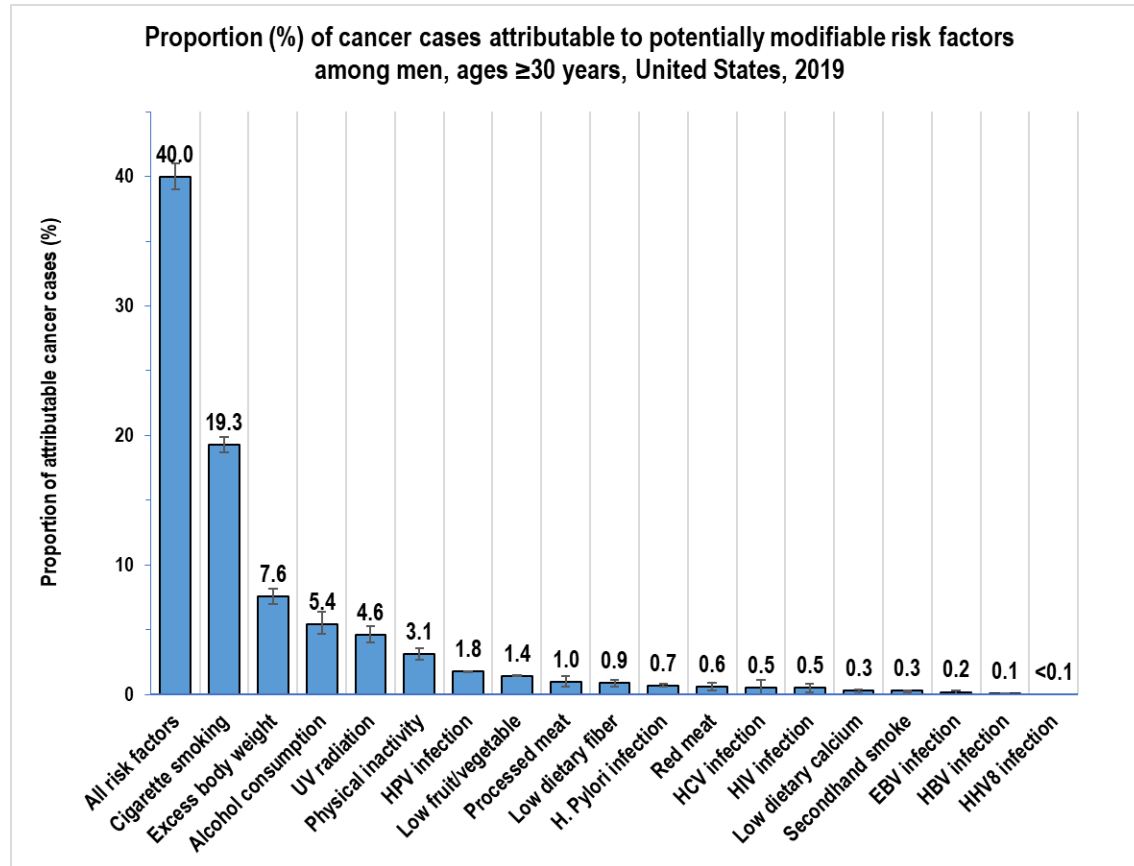
Cancers associated with **ultraviolet radiation**

- Melanoma of the skin
- Not included
 - Other skin cancers
 - Indoor tanning-related melanoma of the eye

Data sources

- Data on **cancer incidence**: CDC's National Program of Cancer Registries (NCPR) and NCI's Surveillance, Epidemiology, and End Results (SEER) Program
- Data on **cancer mortality**: CDC's National Center for Health Statistics
- Data on **risk factors**: National Health Interview Survey (NHIS) and National Health and Nutrition Examination Survey (NHANES)
 - Allowed for an approximately 10-year lag period between exposure and cancer occurrence when data were available (e.g., cancer data from 2019, smoking data from 2008, 2009, and 2010)
- Data on **relative risks** (magnitude of associations between risk factors and cancer): published, large-scale pooled or meta-analyses

Number and proportion of cancers attributable to risk factors

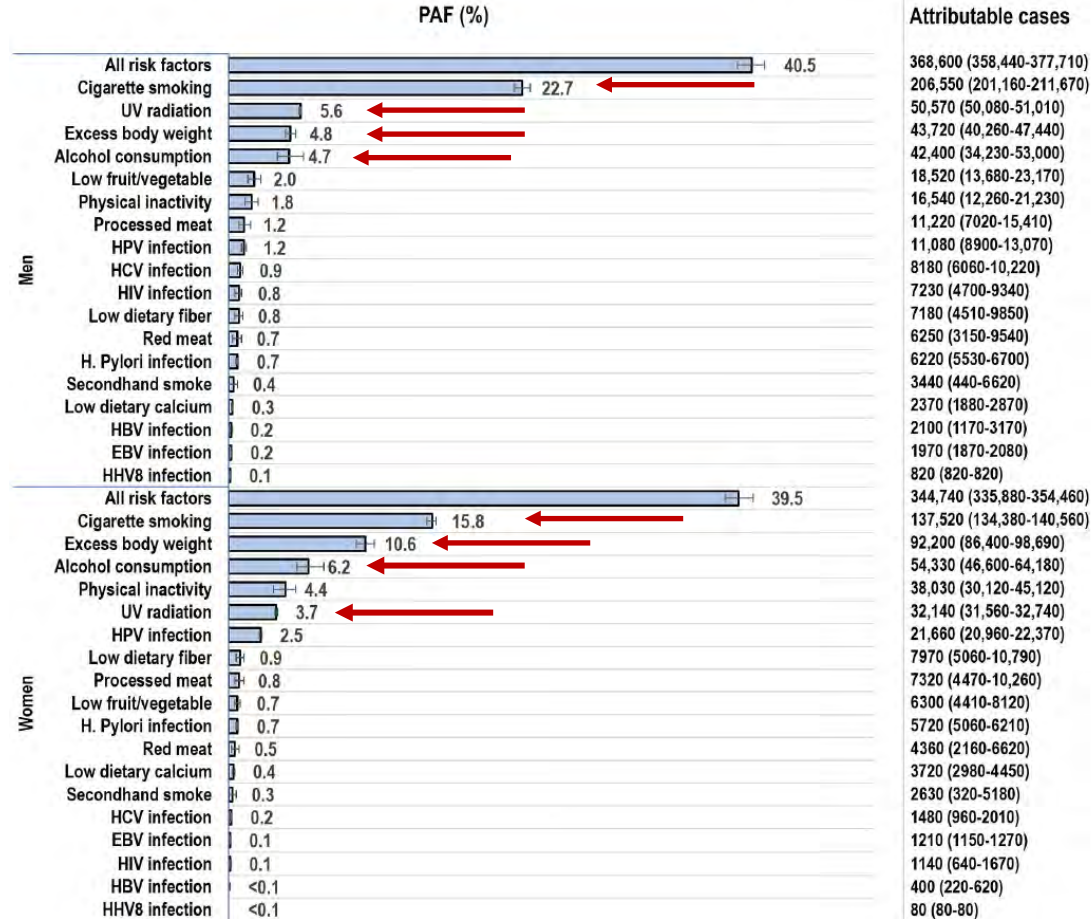


Risk factor	Attributable cases, %	Attributable <i>N</i> of cancer cases (95% CI)
All risk factors	40.0	713,340 (694,320-732,170)
Cigarette smoking	19.3	344,070 (335,540-352,230)
Excess body weight	7.6	135,910 (126,660-146,130)
Alcohol consumption	5.4	96,730 (80,830-117,180)
UV radiation	4.6	82,710 (81,630-83,740)
Physical inactivity	3.1	54,570 (42,380-66,350)
HPV infection	1.8	32,730 (29,860-35,430)
Low fruit/vegetable	1.4	24,820 (18,090-31,290)
Processed meat	1.0	18,540 (11,500-25,660)
Low dietary fiber	0.9	15,150 (9,570-20,630)
<i>H. Pylori</i> infection	0.7	11,940 (10,590-12,920)
Red meat	0.6	10,610 (5,320-16,160)
HCV infection	0.5	9,660 (7,030-12,230)
HIV infection	0.5	8,370 (5,340-11,010)
Low dietary calcium	0.3	6,090 (4,860-7,320)
Secondhand smoke	0.3	6,070 (760-11,800)
EBV infection	0.2	3,180 (3,020-3,350)
HBV infection	0.1	2,500 (1,400-3,800)
HHV8 infection	<0.1	890 (890-890)

Total *N* of cases attributable to evaluated risk factors:

368,600 in men

344,740 in women



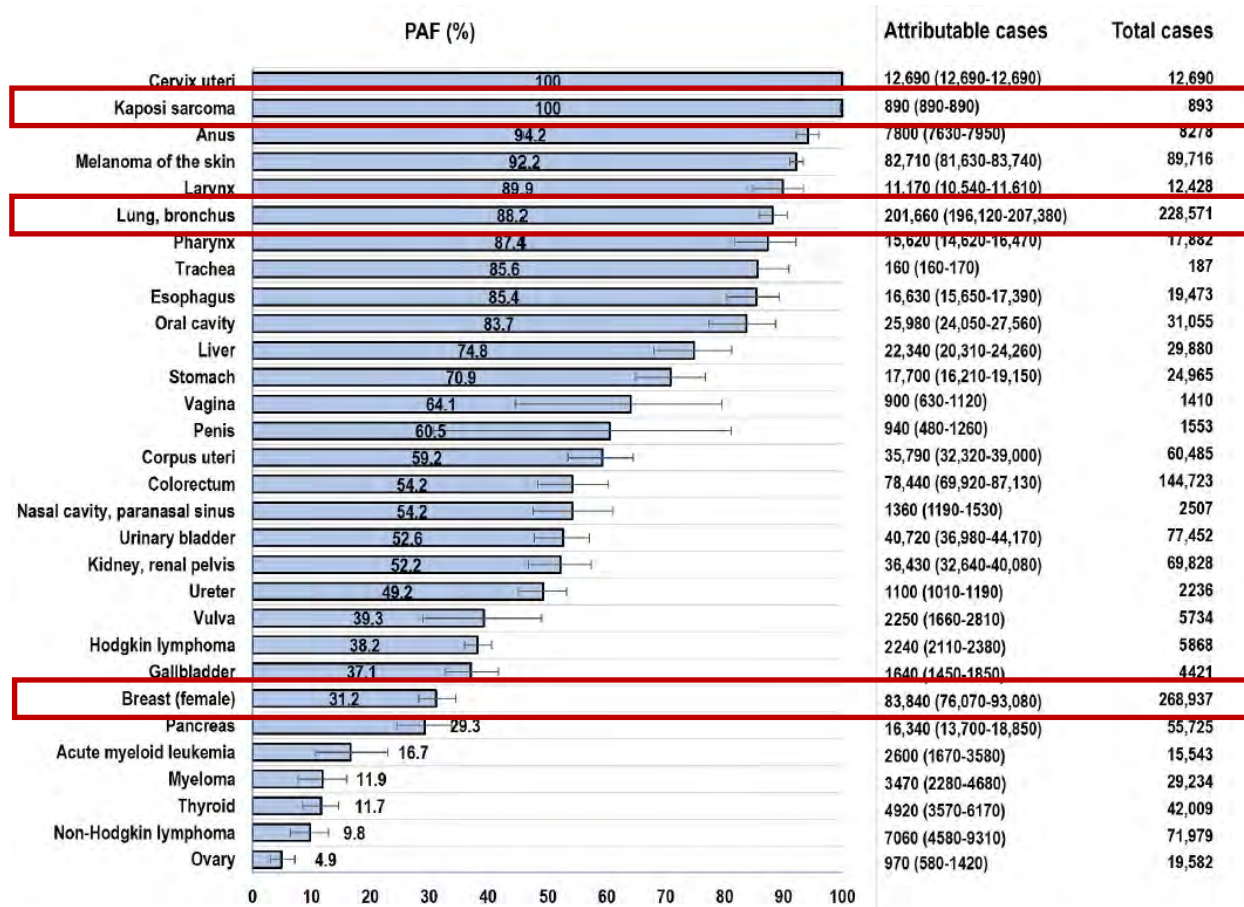
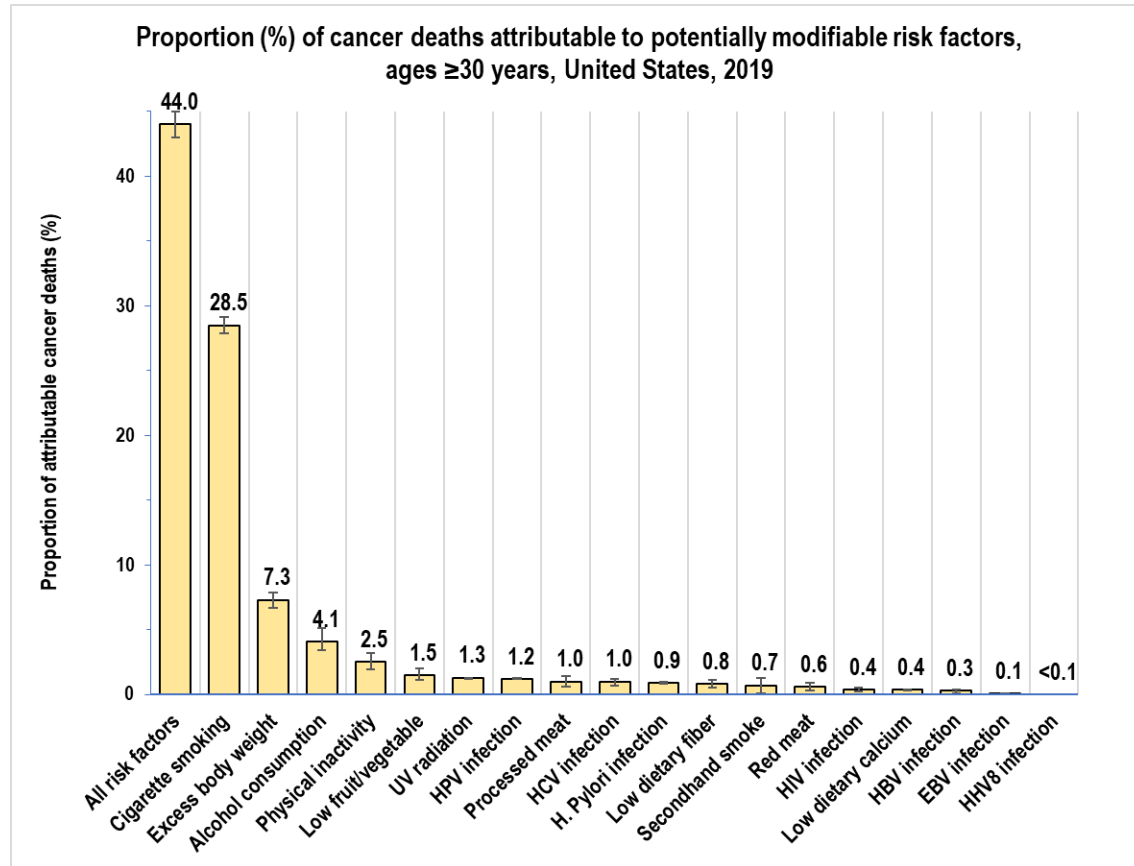


TABLE 2 Estimated cancer cases in adults 30 years and older attributable to potentially modifiable risk factors by sex, risk factor, and cancer type: United States, 2019.

Cancer	Men		Women		Both sexes combined	
	Attributable cases, No. (95% CI)	PAF (95% CI), %	Attributable cases, No. (95% CI)	PAF (95% CI), %	Attributable cases, No. (95% CI)	PAF (95% CI), %
Cigarette smoking						
Lung, bronchus	101,010 (100,260–101,770)	87.2 (86.6–87.9)	94,580 (93,750–95,440)	83.9 (83.1–84.6)	195,590 (194,010–197,210)	85.6 (84.9–86.3)
Trachea	100 (100–100)	88.6 (86.8–89.5)	60 (60–60)	84.9 (83.6–86.3)	160 (160–170)	85.6 (85.6–90.9)
Larynx	8000 (7240–8580)	80.7 (73.1–86.5)	1960 (1740–2120)	77.8 (69.2–84.4)	9960 (8980–10,700)	80.1 (72.3–86.1)
Pharynx	8390 (7380–9340)	58.0 (50.9–64.5)	1770 (1520–2000)	52.0 (44.8–58.8)	10,160 (8900–11,340)	56.8 (49.8–63.4)
Oral cavity	11,840 (10,410–13,180)	57.1 (50.3–63.6)	5200 (4480–5900)	50.3 (43.3–57.1)	17,030 (14,890–19,090)	54.8 (47.9–61.5)
Nasal cavity, paranasal sinus	860 (750–960)	56.8 (50.0–63.4)	500 (430–570)	50.2 (43.3–57.1)	1360 (1190–1530)	54.2 (47.5–61.0)
Esophagus	8510 (7800–9170)	55.5 (50.8–59.8)	1990 (1800–2170)	48.2 (43.7–52.7)	10,500 (9600–11,350)	53.9 (49.3–58.3)
Urinary bladder	30 990 (28 370–33 330)	52.6	8300 (7490–9030)	44.8	39 280 (35 850–42 360)	50.7

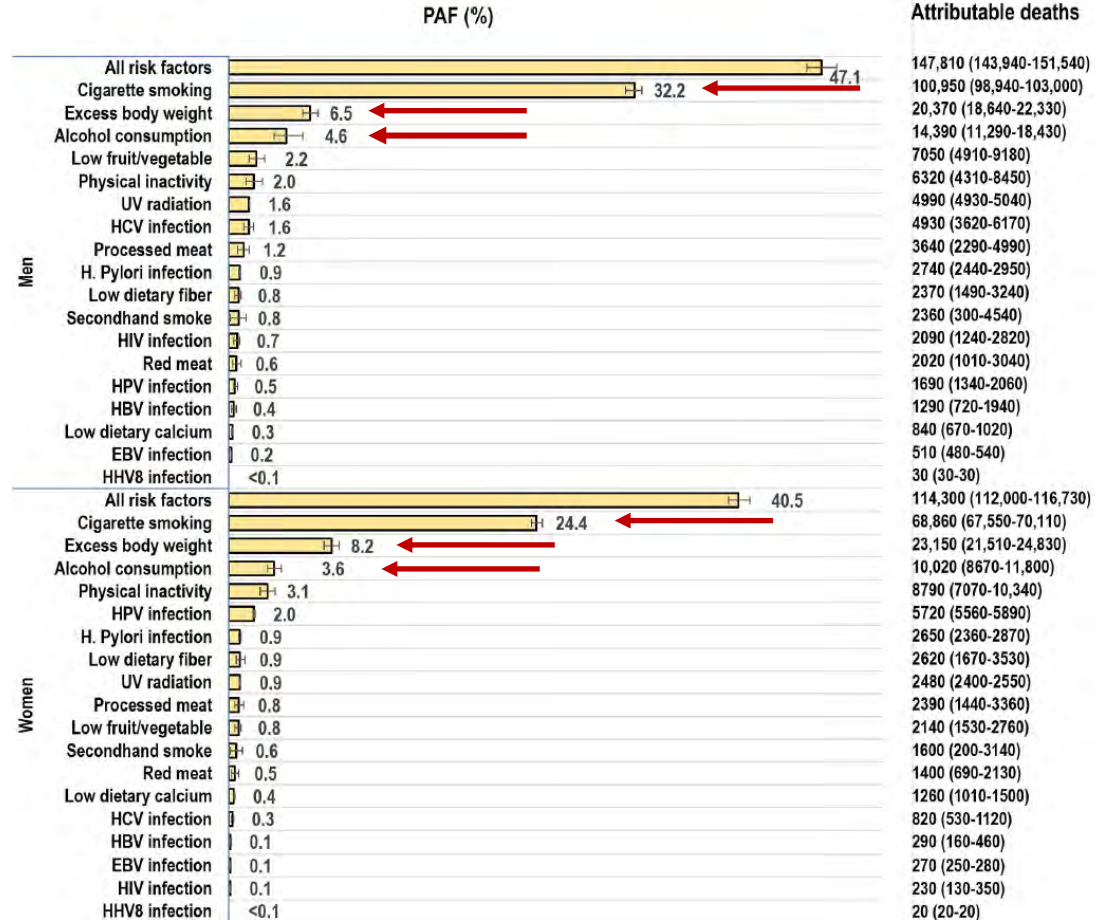


Risk factor	Attributable deaths, %	Attributable <i>N</i> of cancer deaths (95% CI)
All risk factors	44.0	262,120 (255,940-268,270)
Cigarette smoking	28.5	169,810 (166,490-173,100)
Excess body weight	7.3	43,520 (40,150-47,160)
Alcohol consumption	4.1	24,410 (19,960-30,230)
Physical inactivity	2.5	15,110 (11,370-18,790)
Low fruit/vegetable	1.5	9,190 (6,440-11,940)
UV radiation	1.3	7,470 (7,340-7,590)
HPV infection	1.2	7,410 (6,900-7,960)
Processed meat	1.0	6,030 (3,730-8,340)
HCV infection	1.0	5,750 (4,150-7,290)
<i>H. Pylori</i> infection	0.9	5,390 (4,790-5,810)
Low dietary fiber	0.8	4,990 (3,160-6,770)
Secondhand smoke	0.7	3,960 (500-7,680)
Red meat	0.6	3,430 (1,700-5,170)
HIV infection	0.4	2,330 (1,370-3,180)
Low dietary calcium	0.4	2,100 (1,680-2,530)
HBV infection	0.3	1,590 (880-2,400)
EBV infection	0.1	780 (730-820)
HHV8 infection	<0.1	50 (50-50)

Total N of deaths attributable to evaluated risk factors:

147,810 in men

114,300 in women



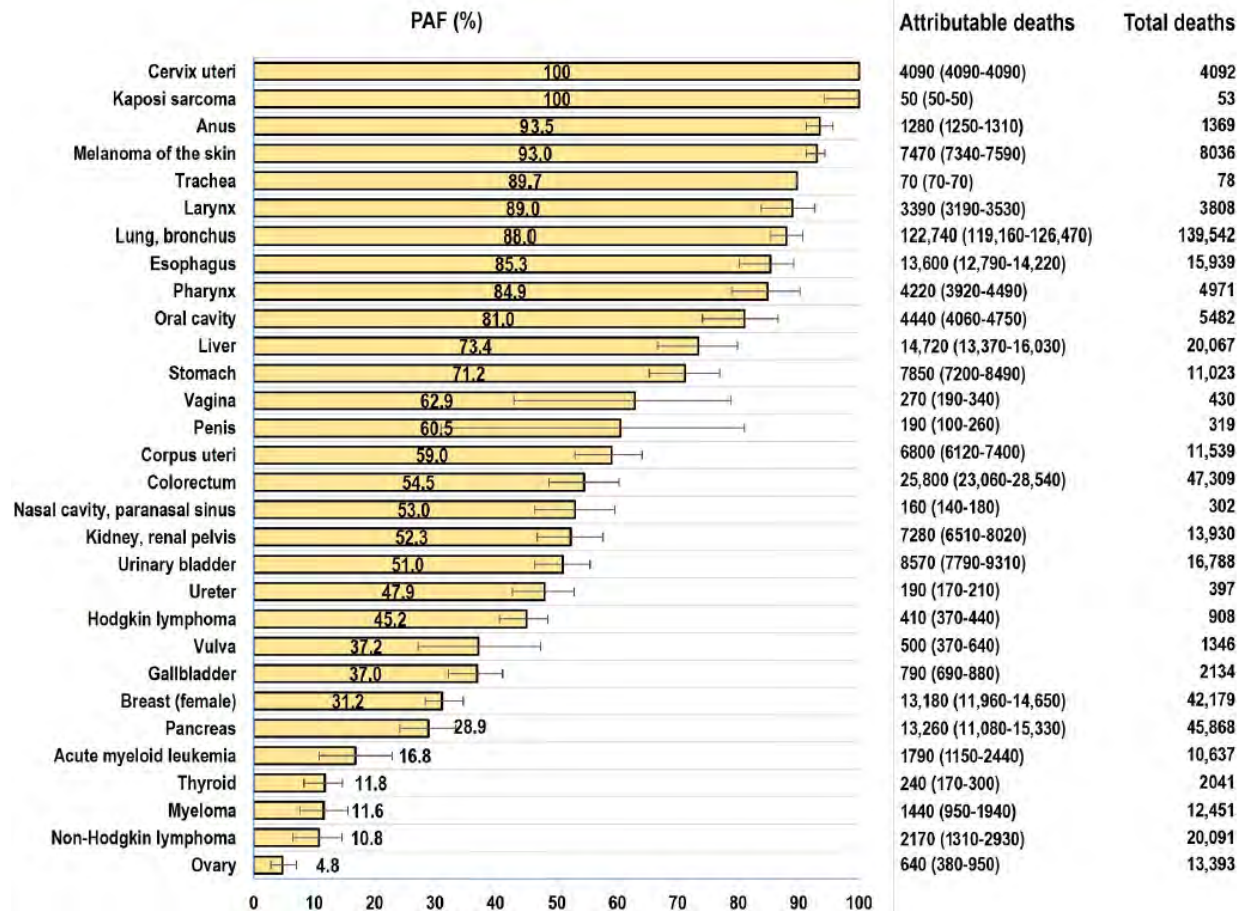
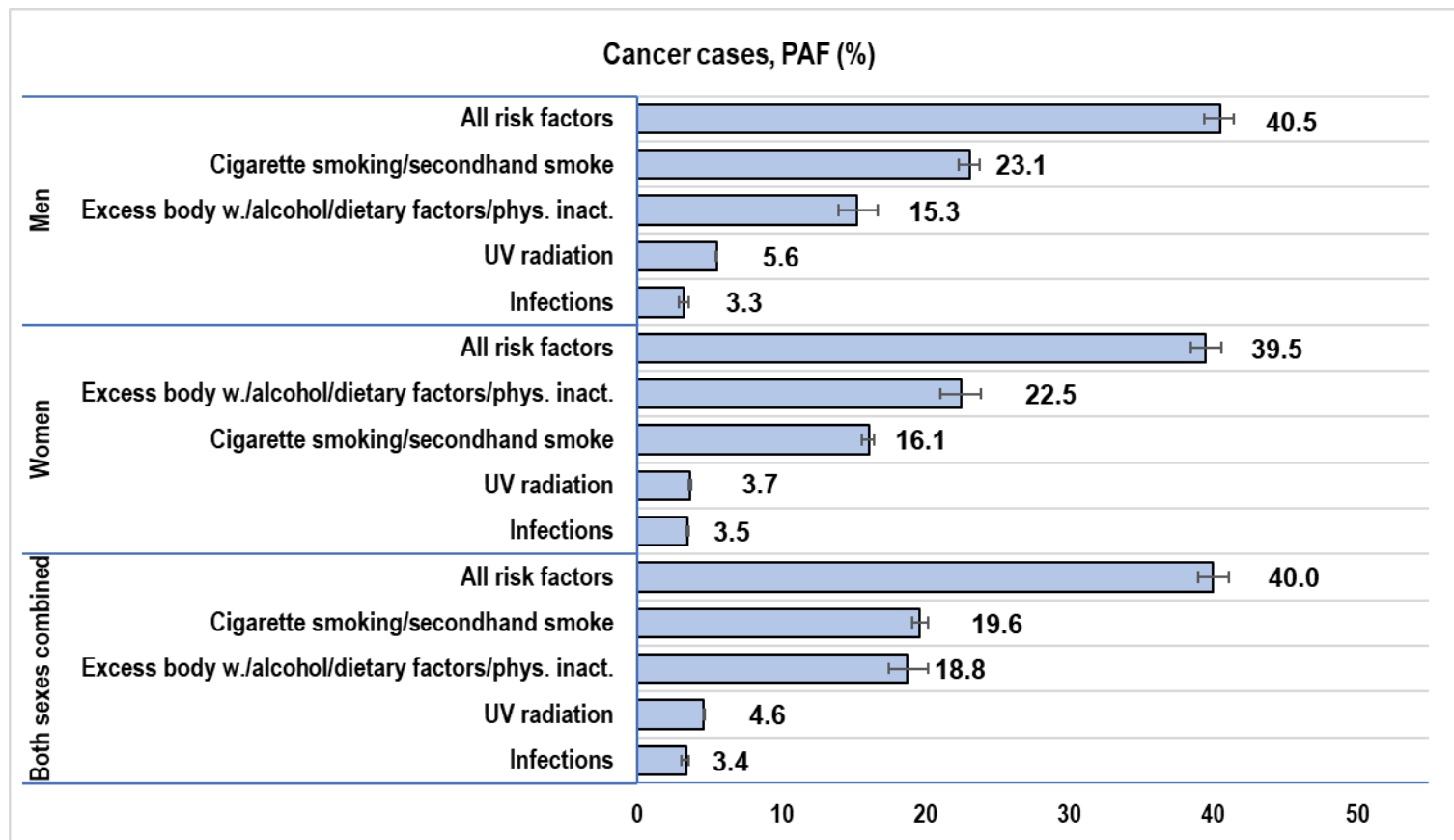
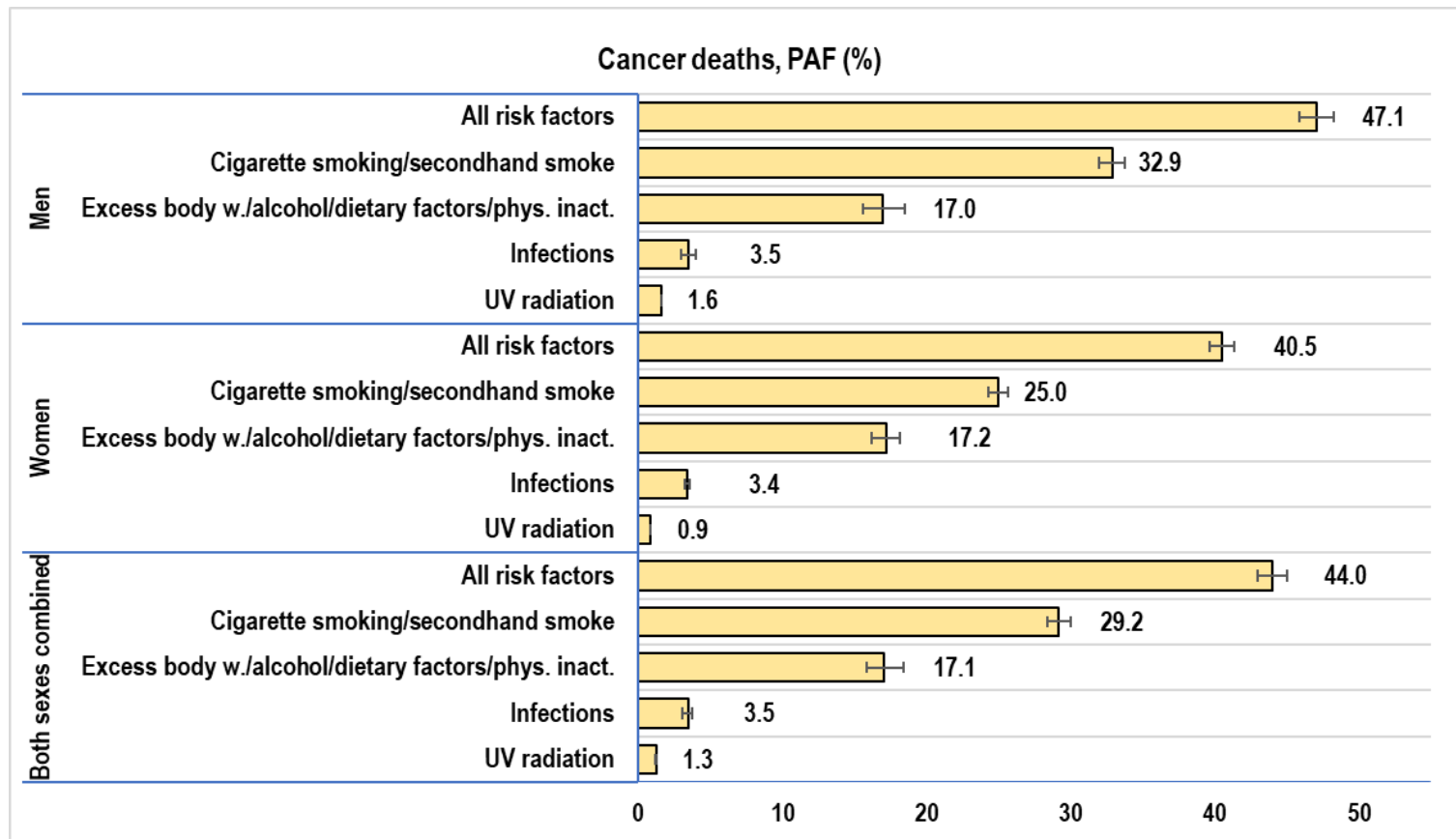


TABLE 5 Estimated cancer deaths in adults 30 years and older attributable to potentially modifiable risk factors by sex, risk factor, and cancer type: United States, 2019.

Cancer	Men		Women		Both sexes combined	
	Attributable cases, No. (95% CI)	PAF, % (95% CI)	Attributable cases, No. (95% CI)	PAF, % (95% CI)	Attributable cases, No. (95% CI)	PAF, % (95% CI)
Cigarette smoking						
Trachea	40 (40–40)	87.5 (87.5–87.5)	30 (30–30)	86.7 (86.7–90.0)	70 (70–70)	89.7 (89.7–89.7)
Lung, bronchus	65,040 (64,550–65,530)	86.9 (86.3–87.6)	53,750 (53,250–54,270)	83.1 (82.3–83.9)	118,790 (117,800–119,800)	85.1 (84.4–85.9)
Larynx	2420 (2180–2600)	79.6 (71.9–85.6)	590 (520–640)	76.4 (67.4–83.1)	3010 (2700–3240)	79.0 (70.9–85.1)
Pharynx	2170 (1900–2410)	56.9 (49.9–63.3)	570 (490–650)	49.5 (42.6–56.3)	2740 (2390–3060)	55.1 (48.1–61.6)
Esophagus	7080 (6500–7620)	55.3 (50.7–59.5)	1490 (1360–1630)	47.6 (43.2–51.9)	8570 (7850–9250)	53.8 (49.3–58.0)
Nasal cavity, paranasal sinus	100 (90–110)	56.2 (49.4–62.4)	60 (50–70)	46.8 (40.3–53.2)	160 (140–180)	53.0 (46.4–59.6)
Oral cavity	1970 (1740–2200)	55.8 (49.2–62.2)	910 (780–1040)	46.8 (40.3–53.4)	2880 (2530–3240)	52.5 (46.2–59.1)
Urinary bladder	6230 (5690–6730)	51.7	2000 (1800–2190)	42.3	8230 (7500–8920)	49.0





Implications

- Increase awareness.
- Health care providers:
 - risk factor screening, such as:
 - The US Preventive Services Task Force (USPSTF) recommends that health care providers screen children and adolescents aged 6 years and older for obesity and offer or refer them to comprehensive, intensive behavioral interventions to promote healthier body weight,
 - The USPSTF recommends that primary care providers screen individuals aged 18 years and older for unhealthy alcohol use and provide persons engaged in risky or hazardous drinking with brief behavioral counseling interventions to reduce unhealthy alcohol use,
 - screening for and treating HCV infection,
 - other recommended preventive interventions, such as:
 - vaccination against HPV infection when recommended,
 - treating HCV infection in those who tested positive for HCV.

- Public health initiatives, policies
 - For reducing smoking, for example:
 - excise taxes on cigarettes to reduce smoking,
 - As of December 2023, the state cigarette excise tax ranged from \$0.17 in Missouri to \$5.35 in New York (with an additional \$1.50 in New York City) per cigarette pack
 - smoke-free laws,
 - warning labels and media campaigns,
 - marketing bans,
 - assistance with smoking cessation,
 - smoking cessation services, such as counseling and medication, are generally underused, particularly in individuals with lower incomes and those who are Uninsured, and in several states with the highest cigarette smoking prevalence,
 - need for enhancing equitable access to cessation services.

- Cancer mortality rate ratios by age quit smoking among former smokers compared with never smokers (age at risk 25–79 years)



- Examples for promoting healthy diet and physical activity(CDC):
 - Increasing the availability of affordable, healthier food and beverage options at food service venues and vending machines in schools, worksites, and public places,
 - facilitation of the establishment of farmers markets and grocery stores, especially in historically marginalized neighborhoods and food deserts,
 - limitation of advertisements of less healthy foods and beverages
 - improving the built environment (e.g., enhancing activity-friendly routes to everyday destinations, public transit, and access to places for physical activity, such as parks and safe sidewalks),
 - school and youth programs (e.g., well designed physical education and before and after-school activities),
 - education programs.

Limitations

- The 10-year lag period between exposure and cancer incidence or mortality may not be an accurate exposure window for all cancer types and risk factors.
- We used same relative risks (RRs) across sexes and age groups, although the RRs may not be homogenous across these groups.
- Were not able to examine the effects of exposure to risk factors in adolescence or earlier.
- Assumed the risk factors were independent (no interactions).
- Did not include cancer sites without sufficient or strong evidence of a causal association with evaluated risk factors, as well as several other potentially modifiable risk factors as a result of inadequate data or for other reasons.

Select risk factors NOT included in the study

Risk factors not considered	Associated cancer types
Smokeless tobacco	Oral cavity, esophagus, pancreas
Aflatoxins	Liver
Arsenic in drinking water	Lung, skin, urinary bladder
Foods preserved by salting	Stomach
Low whole grains consumption	Colorectum
Human T-cell lymphotropic virus type 1	Adult T-cell lymphoma/leukemia
<i>Clonorchis sinensis</i> and <i>Opisthorchis viverrini</i>	Cholangiocarcinoma
<i>Schistosoma hematobium</i>	Bladder cancer
Indoor and outdoor air pollution other than secondhand smoke	Lung cancer
Ionizing radiation (other than ultraviolet)	Multiple cancer types
Occupational carcinogens or professions	Multiple cancer types

Conclusions

- An estimated 40% of all cancer cases and nearly one half of all cancer deaths in the U.S. in 2019 were attributable to the evaluated.
- Morbidity and premature mortality from cancer in the U.S. can be substantially reduced through broad and equitable implementation of known preventive initiatives, such as:
 - excise taxes on cigarettes to reduce smoking,
 - screening for and treating HCV infection,
 - vaccination against HPV infection.

- Further implementation research is needed for broad application of known interventions, particularly for excess body weight, unhealthy diet, alcohol consumption, and physical inactivity.
- Tailored and mutually reinforcing interventions are more likely to mitigate these risk factors, especially in historically marginalized populations, which are usually disproportionately affected by these factors.

- Further research is also needed on the
 - associations between potentially modifiable risk factors and cancers for which the current evidence for causality in humans is limited,
 - common cancers with few established modifiable risk factors (e.g., prostate cancer and non-Hodgkin lymphoma),
 - other potentially modifiable exposures, such as occupational
 - carcinogens, air pollution, and other environmental risk factors,
 - associations of exposures throughout the lifetime,
 - Interactions between risk factors.

Thank You!

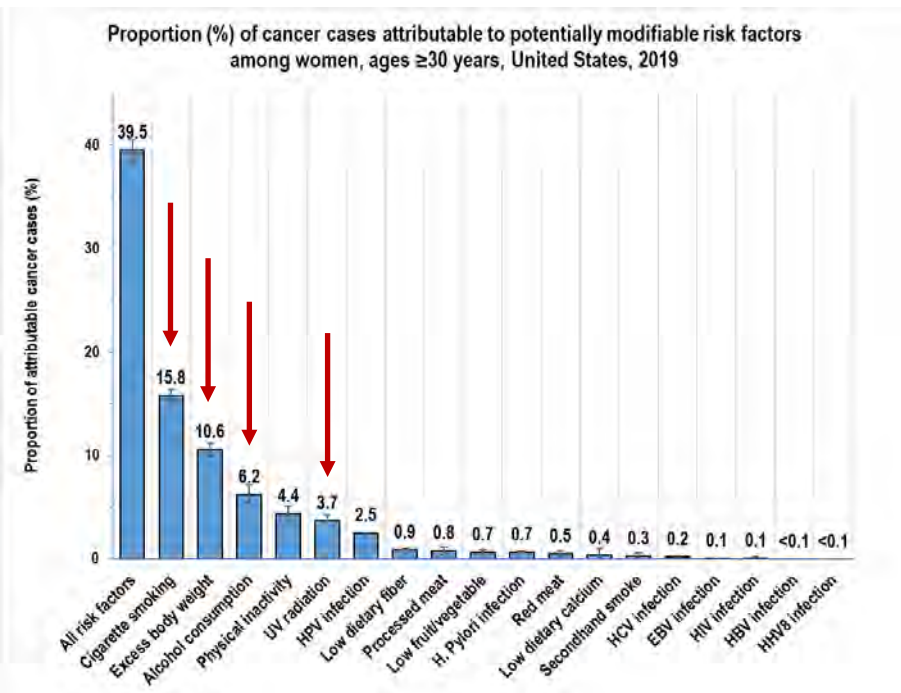
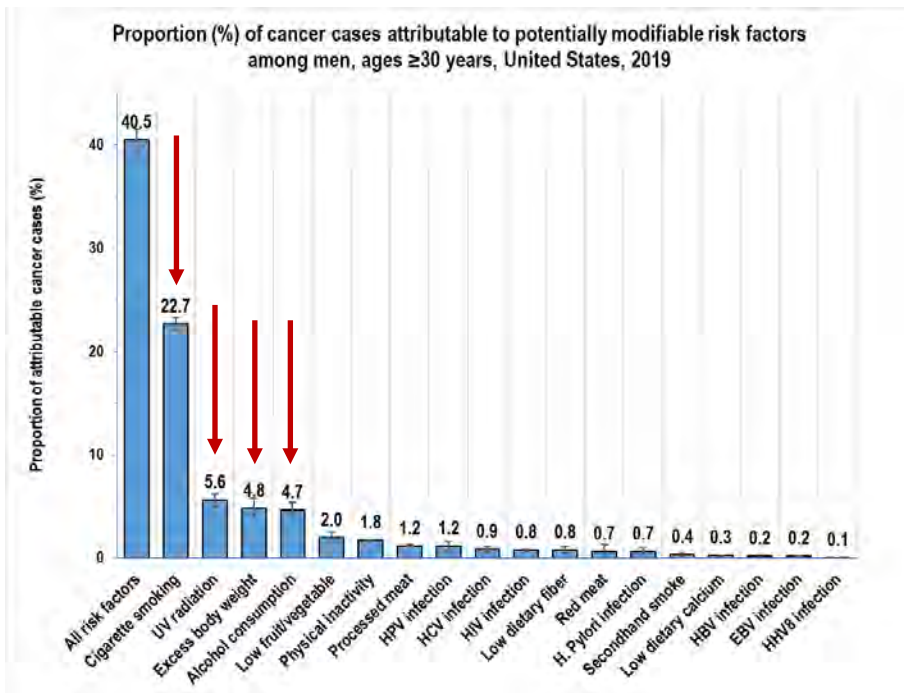
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Men

Women



Total N of cases attributable to evaluated risk factors: **368,600 in men, 344,740 in women.**

Questions

Upcoming NEBGH events

- **September 12** – Pharmacy Benefits 2024
- **September 16** – Mondays w/ Dr. Mark & Dr. Michael
- **September 25** – The Loneliness Epidemic in America and Other Updates from the Surgeon General’s Office
- **September 26** – Up and Comers BenefitsBlueprint Series: Benchmarking Leave and Time Off
- **November 7** - Advances in Lung Cancer: Progress, Promise, and Workplace Support