The alcohol and cancer webinar will begin shortly.

Engagement: Submit questions at any time using the Chat Panel and select All Participants. You may need to activate the appropriate box using the floating navigation panel, found on the lower right hand corner of your screen.

Recording: This Webinar will be recorded and be available soon.

Technical Issues: If you have any technical issues, please contact Vanessa Torres, the Host of the webinar via the Chat Panel.

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Division of Cancer Control and Population Sciences

Alcohol as a Target for Cancer Prevention and Control: Research Challenges.

Virtual webinar
December 18, 2020

Acknowledgements

- **Co-Chairs**
  - Dr. Susan Gapstur, Consultant
  - Dr. William Klein, NCI
- **Steering Committee**
  - Dr. Elisa Bandera, Rutgers Cancer Institute of New Jersey
  - Dr. David Jernigan, Boston University School of Public Health
  - Dr. Noelle LoConte, University of Wisconsin School of Medicine and Public Health
  - Dr. Brian Southwell, RTI International and Duke University
  - Dr. Vasilis Vasiliou, Yale School of Public Health
- **NCI DCCPS Organizers**
  - Dr. Tanya Agurs-Collins, NCI
  - Dr. David Berrigan, NCI
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  - Ms. Jennifer Schaefer and Ms. Vanessa Torres, ICF

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Webinar Goals and Agenda

- Presentations regarding what is known and identify critical gaps in four key areas.
  1. the epidemiology and biology of alcohol and cancer risk.
  2. the effects of alcohol use during and after cancer treatment.
  3. individual and policy level interventions focused on reducing alcohol consumption.
  4. the public awareness of and communications about the alcohol and cancer link.
- Following each presenter, there will be open discussion. Please submit comments and questions using the chat box.

Disclosure Statement

Susan Gapstur's efforts to chair this activity and to draft of an executive summary and white paper are supported by the National Cancer Institute.

Alcohol Produced as Early as 7000– 6600 BC in China*

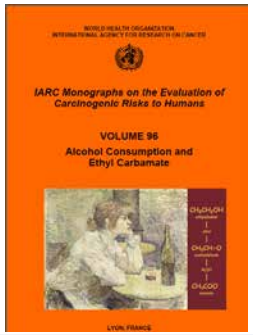
• Cultural	• Religious
• Social	• Relaxation
• Celebratory	

McGovern et al., *Proc Natl Acad Sci*, 101(51), 17593– 8; 2004

Alcohol Drinking and Health

- Ethanol:
  - Principal alcohol in alcoholic beverages
  - Psychoactive agent that has dependence-producing properties
- Worldwide, 3 million deaths every year (5.3% of all deaths) result from harmful use of alcohol.
- Harmful use of alcohol is a causal factor in more than 200 disease and injury conditions.
- Overall, 5.1 % of the global burden of disease and injury is attributable to alcohol, as measured in disability-adjusted life years (DALYs).
- Beyond health consequences, the harmful use of alcohol brings significant social and economic losses to individuals and society at large.

https://www.who.int/news-room/fact-sheets/detail/alcohol
Accessed Dec. 6, 2020



IARC Monograph Program

	Volume 46 (1988)	Volume 96 (2010)	Volume 100E (2012)
	Sufficient Evidence of Carcinogenicity		
Alcoholic Beverages	X	X	X
EtOH in Alcohol Beverages		X*	X
Acetaldehyde			X

WCRF/AICR Continuous Update Project

World Cancer Research Fund

American Institute for Cancer Research

CUP Continuous Update Project

Analysing research on cancer prevention and survival

Understanding the Role of Alcohol Consumption in Cancer Etiology

Kevin Shield, PhD

Head, Collaborating Centre in Addiction and Mental Health

Pan American Health Organization

Assistant Professor, Division of Epidemiology

Dalla Lana School of Public Health

University of Toronto

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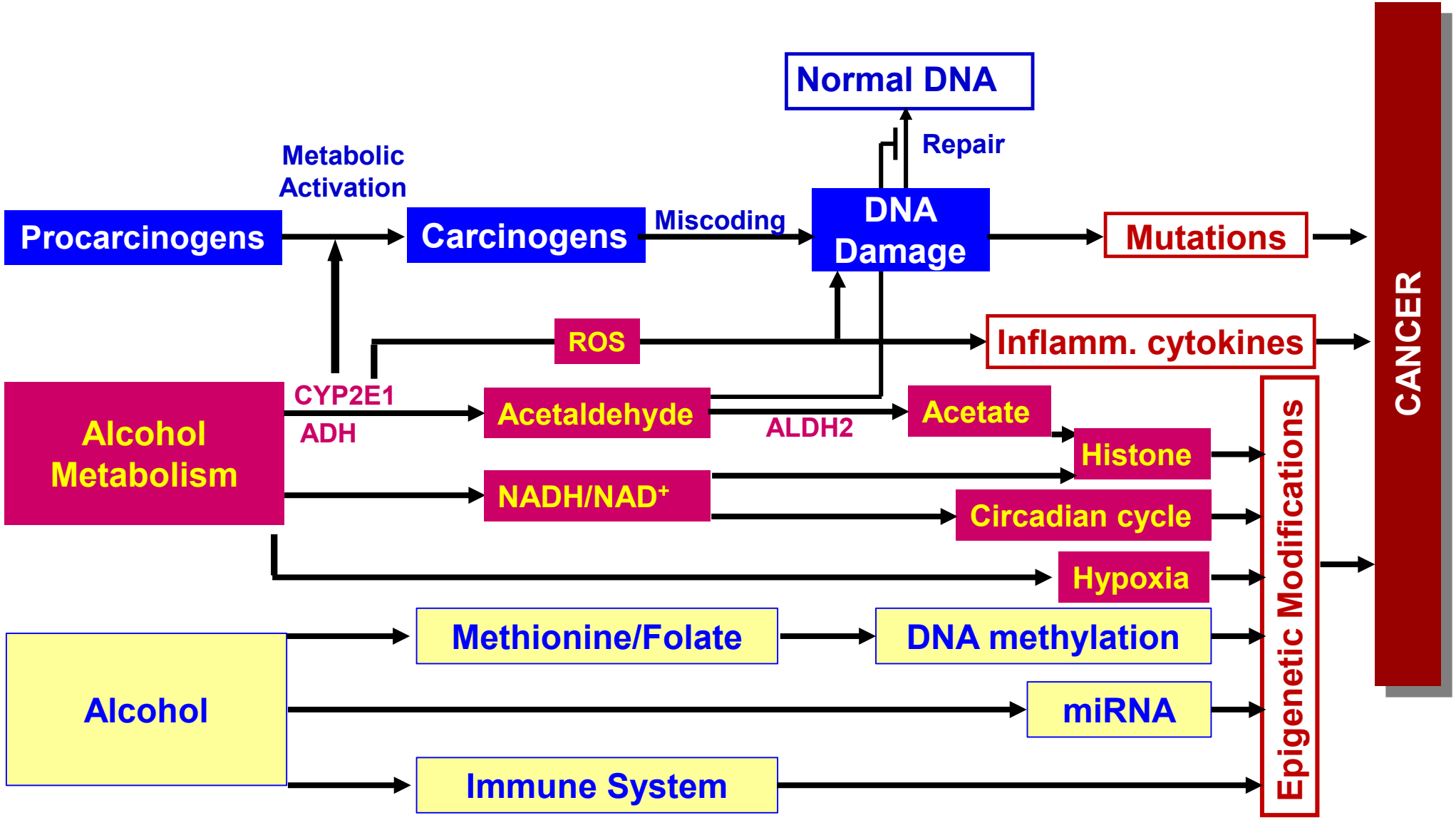
Table 1. Summary of the evidence for a causal relationship between alcohol consumption and the risk of various cancer subtypes [7, 12, 15, 59–67]

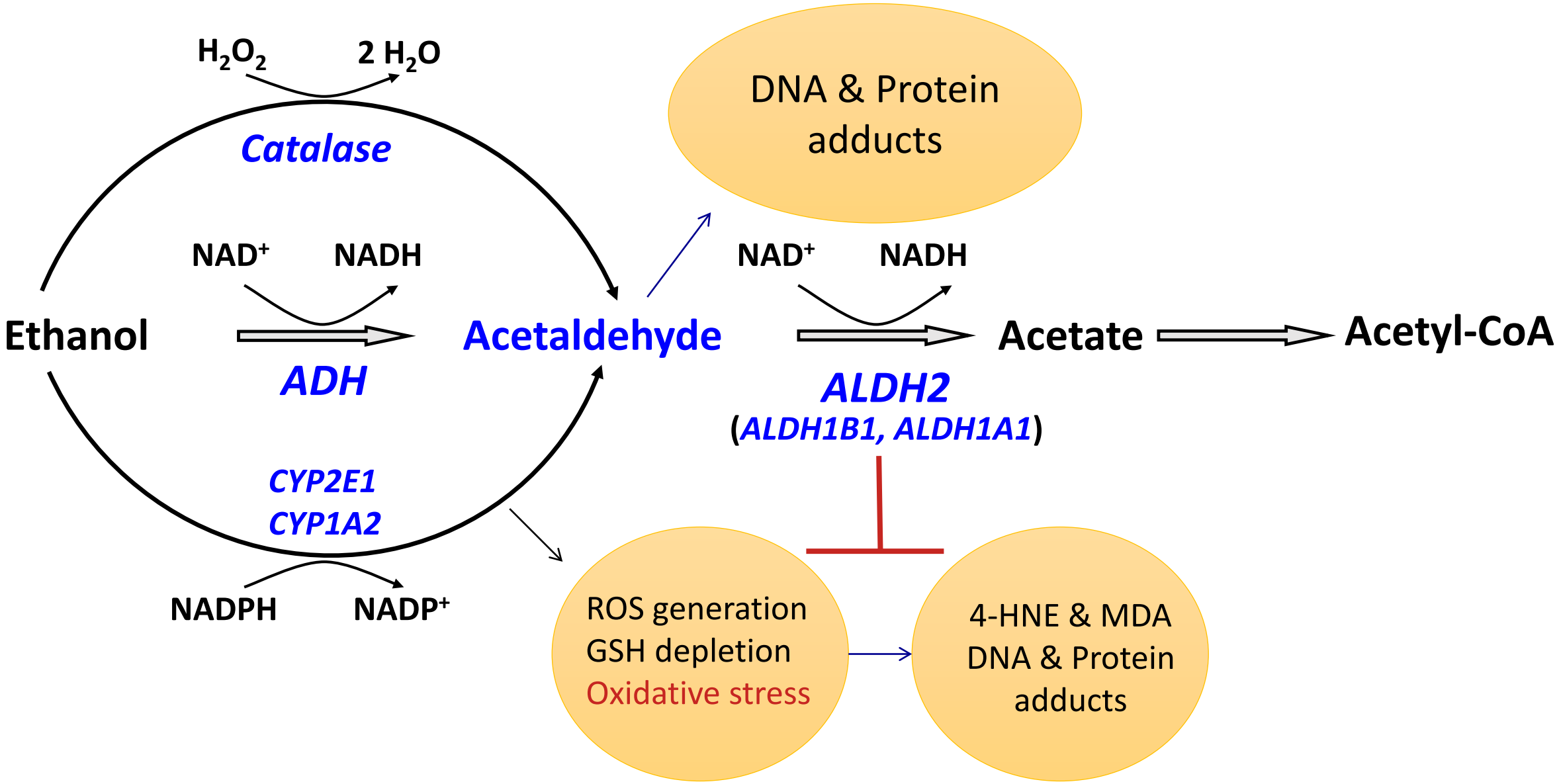
Cancer site (ICD-10 code) and level of causality	Evidence		
	International Agency for Research on Cancer [7, 12] (2010, 2012)	World Cancer Research Fund International (Continuous Update Project) (2018)	L'Institut National Du Cancer France [15] (2007)
Causally related to alcohol consumption			
Oral cavity (C02–06)	Sufficient evidence	Convincing [59]	Convincing
Oropharynx (C01, C09–10)	Sufficient evidence	Convincing [59]	Convincing
Hypopharynx (C12–13)	Sufficient evidence	Convincing [59]	Convincing
Oesophagus (C16)	Sufficient evidence	–	
Oesophagus – adenocarcinoma	–	Limited – no conclusion [60]	Insufficient evidence
Oesophagus – squamous cell carcinoma	–	Convincing [60]	Convincing
Colon (C18)	Sufficient evidence	Convincing (men)/probable (women) [61]	Convincing
Rectum (C19–20)	Sufficient evidence	Convincing (men)/probable (women) [61]	Convincing
Liver (C22)	Sufficient evidence	Convincing [26]	Convincing
Larynx (C32)	Sufficient evidence	Convincing [59]	Convincing
Breast (female) (C50)	Sufficient evidence	Convincing [62]	Convincing
Causality not established			
Stomach (C16)	–	Probable [63]	Controversial results
Gallbladder (C23)	–	Limited – no conclusion [64]	Not established
Pancreas (C25)	Observed association	Limited – suggestive (heavy consumption) [65]	Controversial results
Prostate (C61)	–	Limited – no conclusion [66]	Not established – may be associated at higher alcohol consumption levels
Kidney (C64–65)	Evidence suggesting lack of carcinogenicity	Probable (for alcohol intake up to 30 g/day) [67]	Insufficient data

(Rehm and Shield, Eur Addict Res 2020)

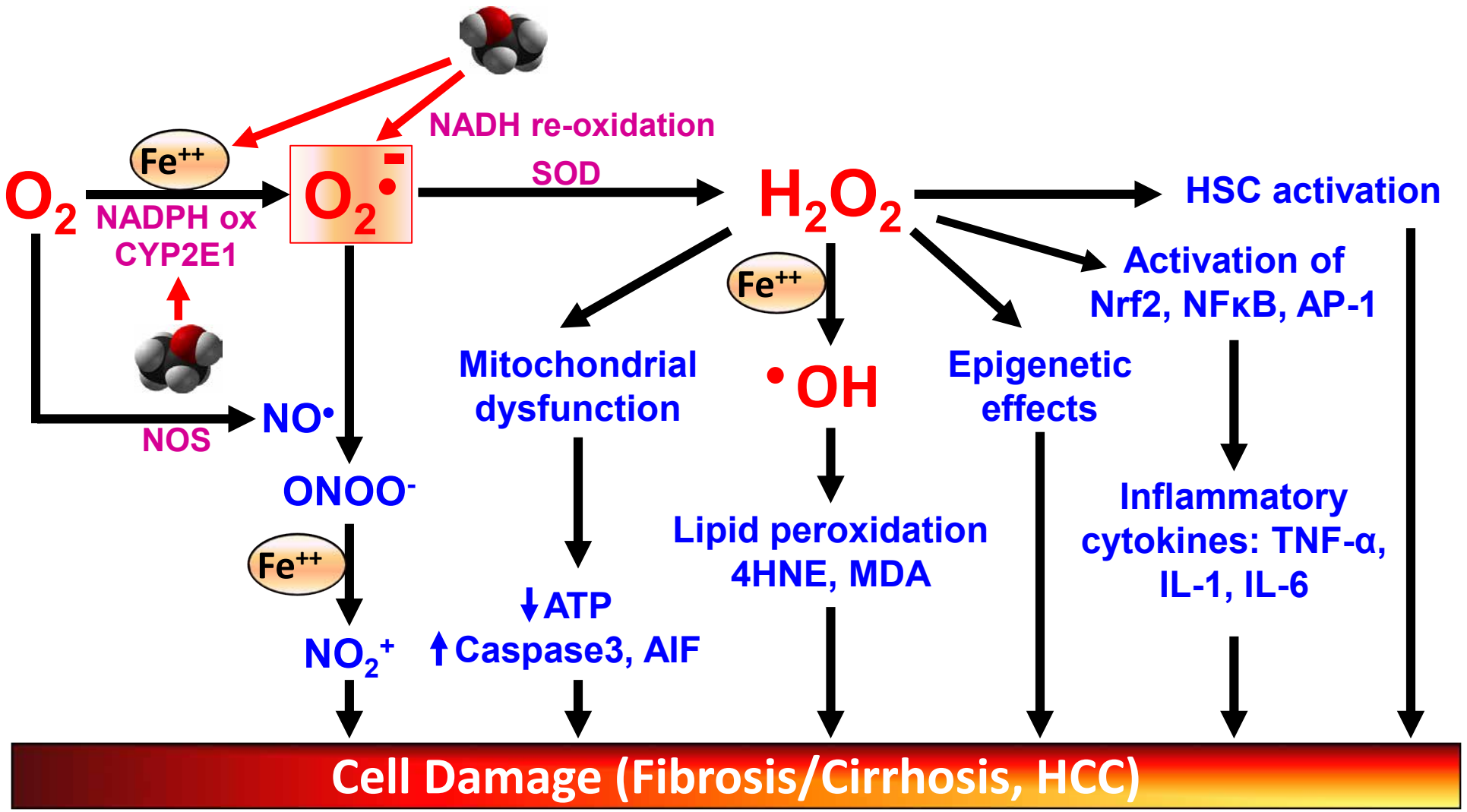
Alcohol and Cancer



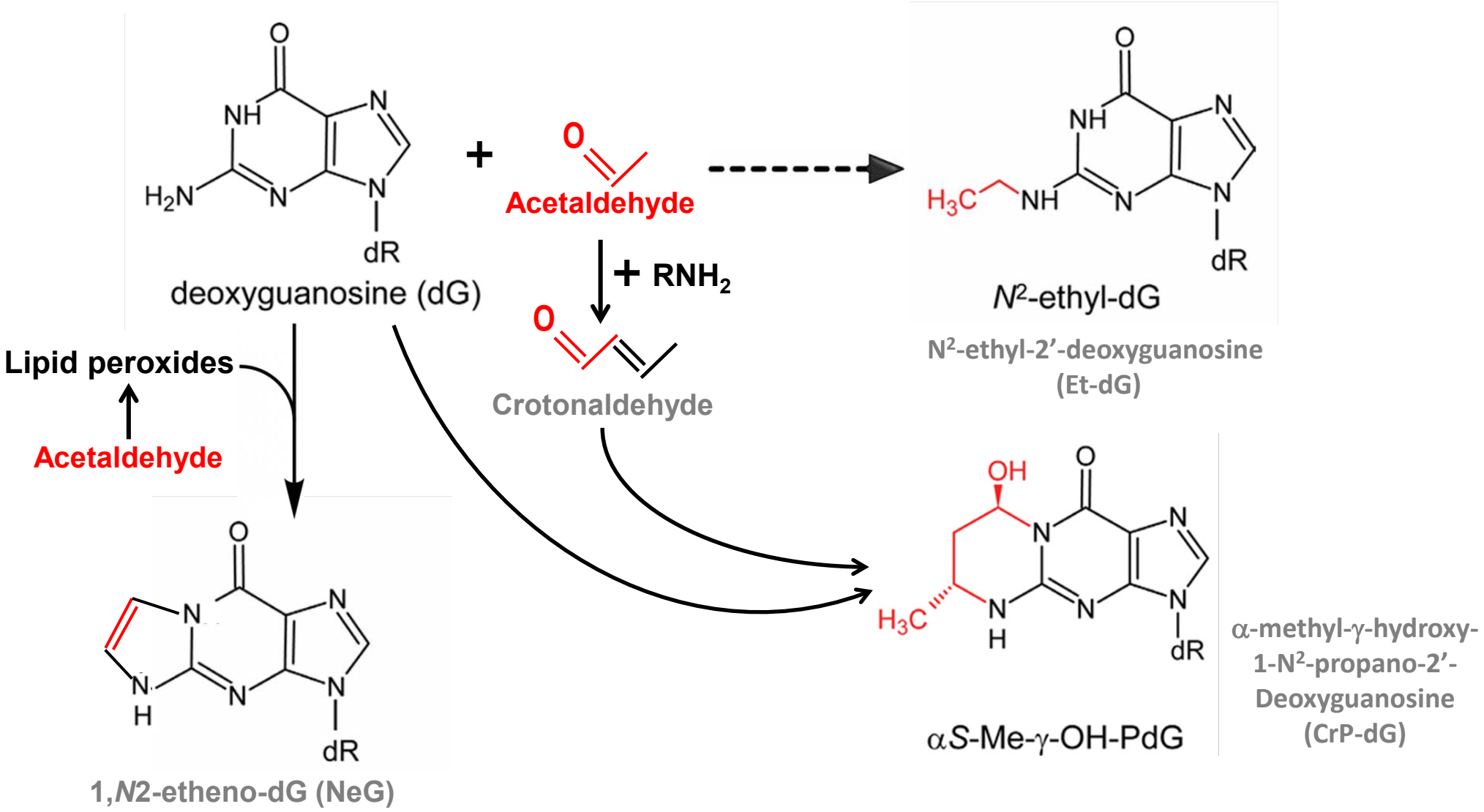
Oxidative Pathways of Alcohol Metabolism



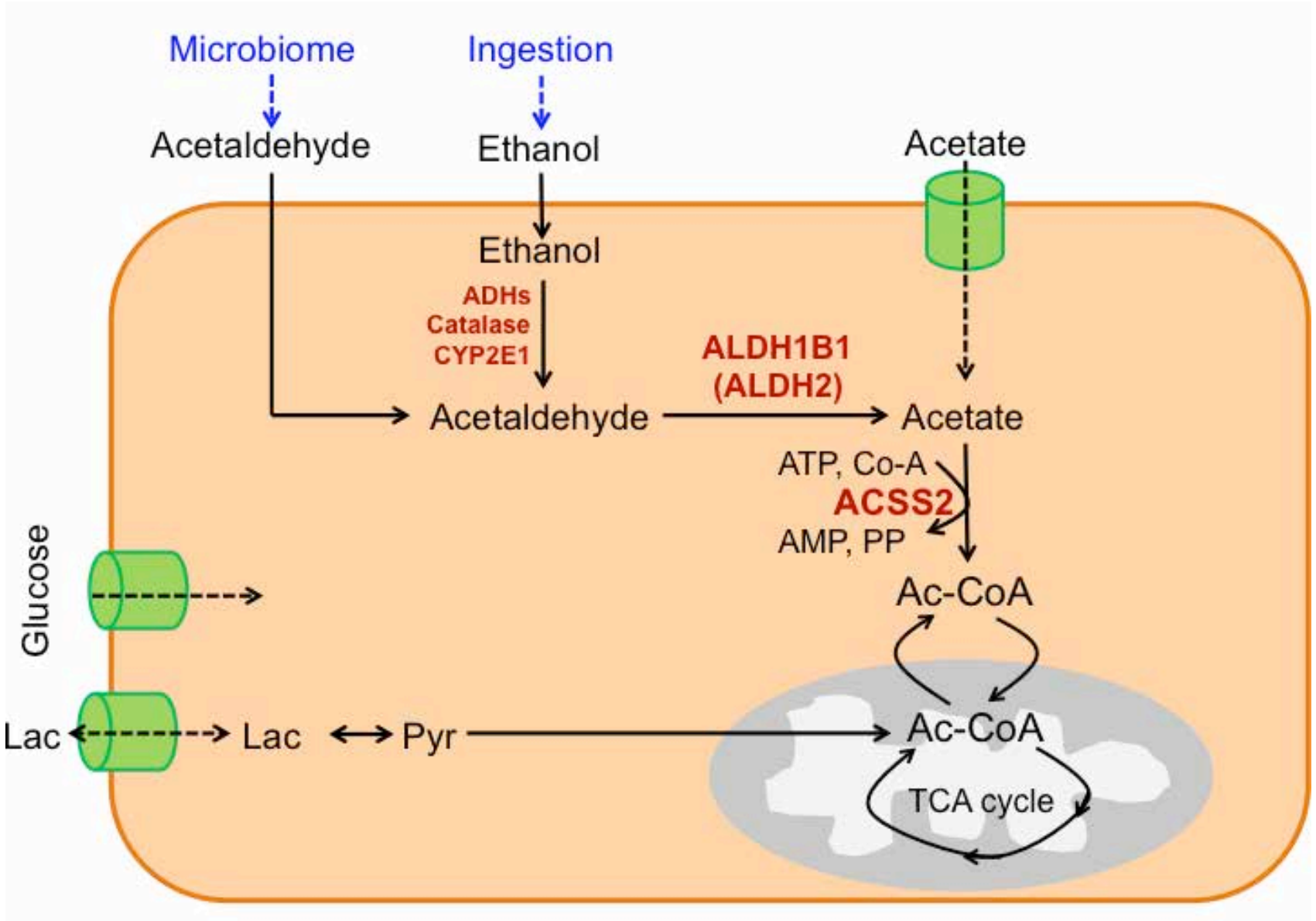
ROS and Cell Damage



Acetaldehyde: DNA Adduct Formation

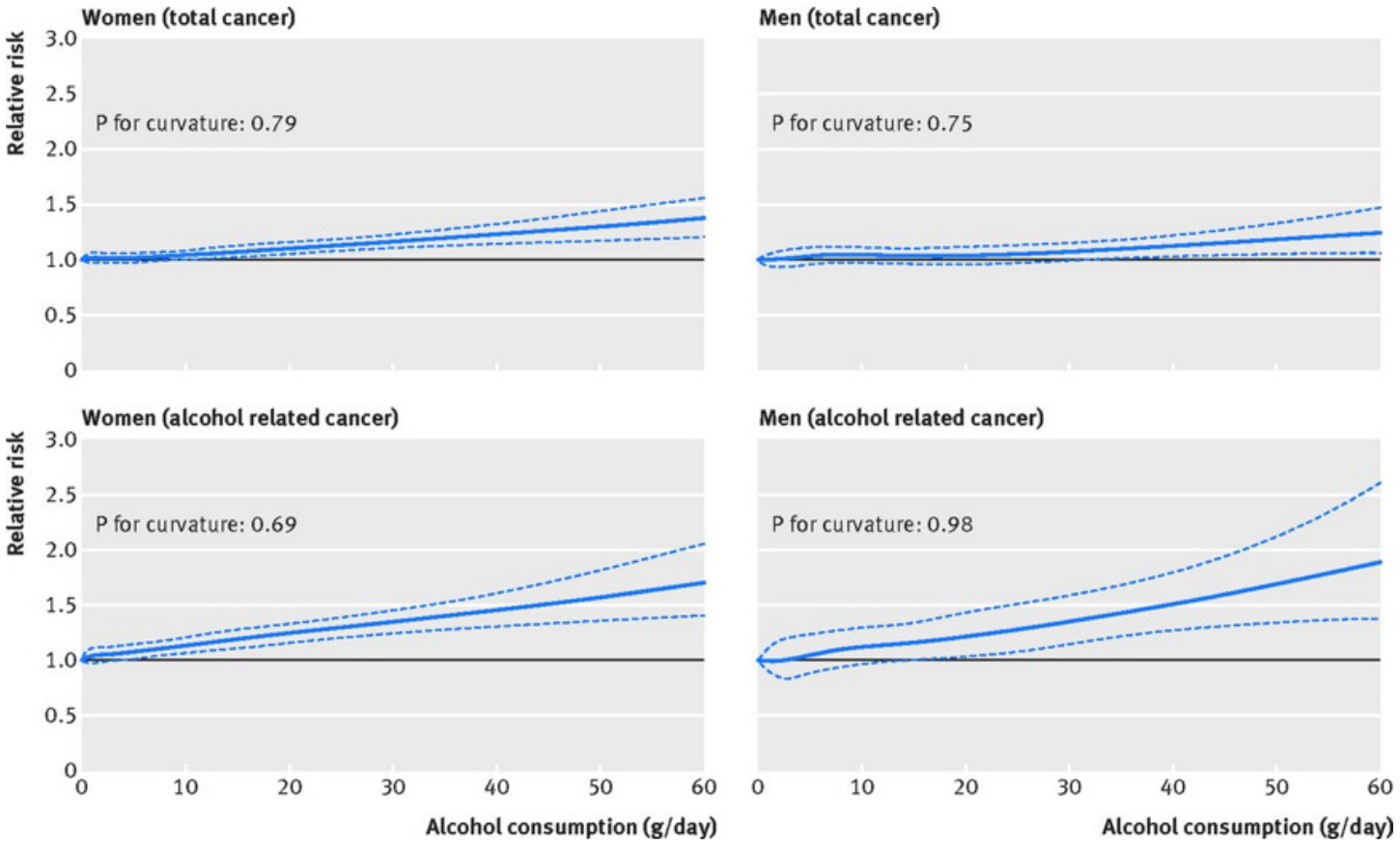


Acetate Dependence of Tumors



Alcohol Consumption and Cancer Risk

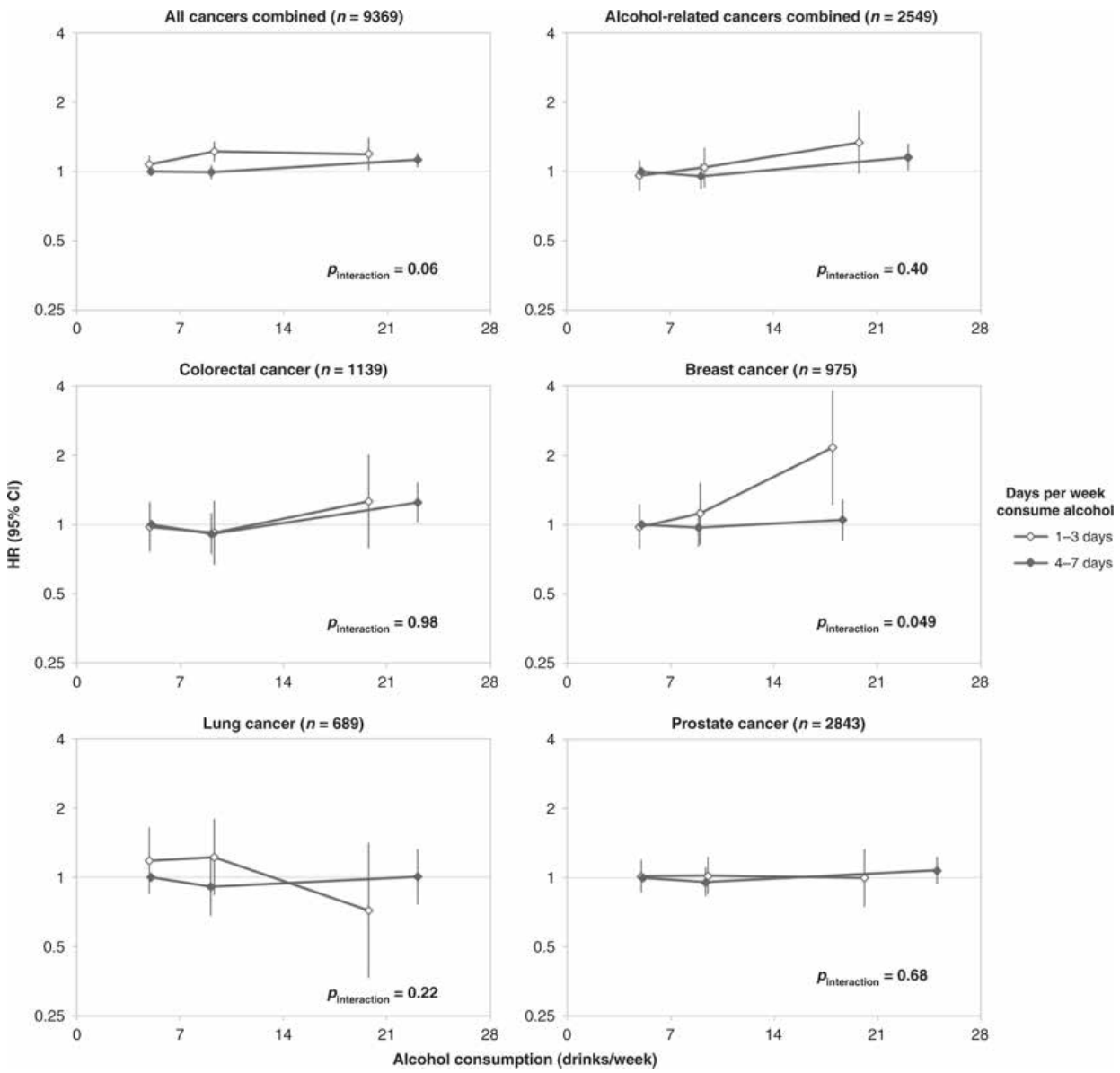
- Alcohol consumption increases cancer risk based on ethanol content (grams per day)
- Low dose alcohol consumption increases cancer risk
- Resveratrol does not meaningfully offset cancer risk (a std. drink of wine contains 1 / 100 000 of a meaningful dose)



Cao et al., 2016, *BMJ*

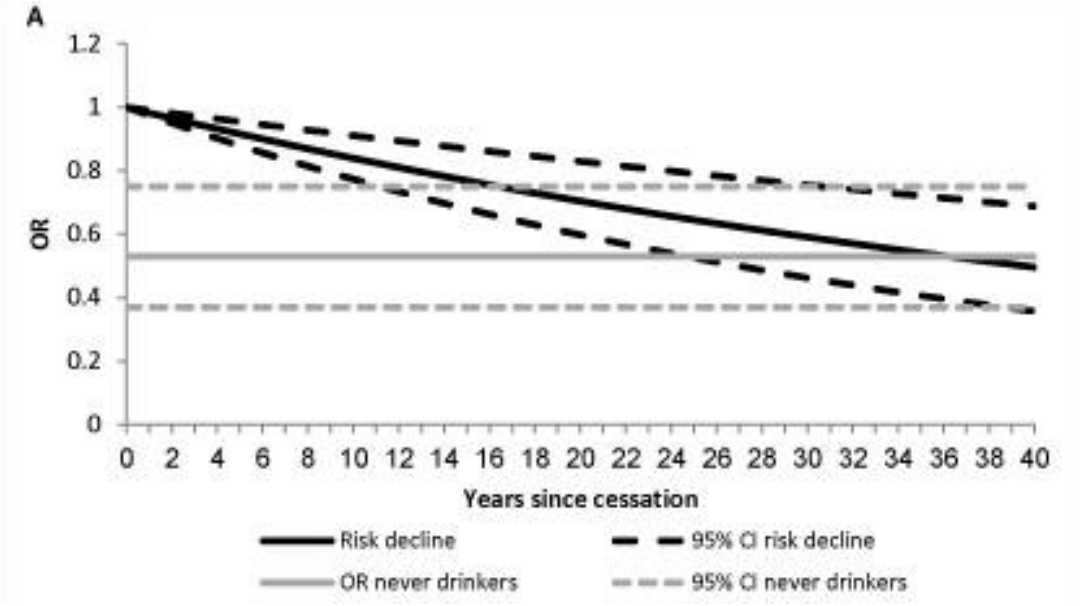
Alcohol Consumption and Heavy Episodic Drinking

- Heavy episodic drinking has been observed to increase the risk of breast cancer [Sarich, 2020].



Modification of Drinking and Cancer Risk

Laryngeal cancer



Pharyngeal cancer

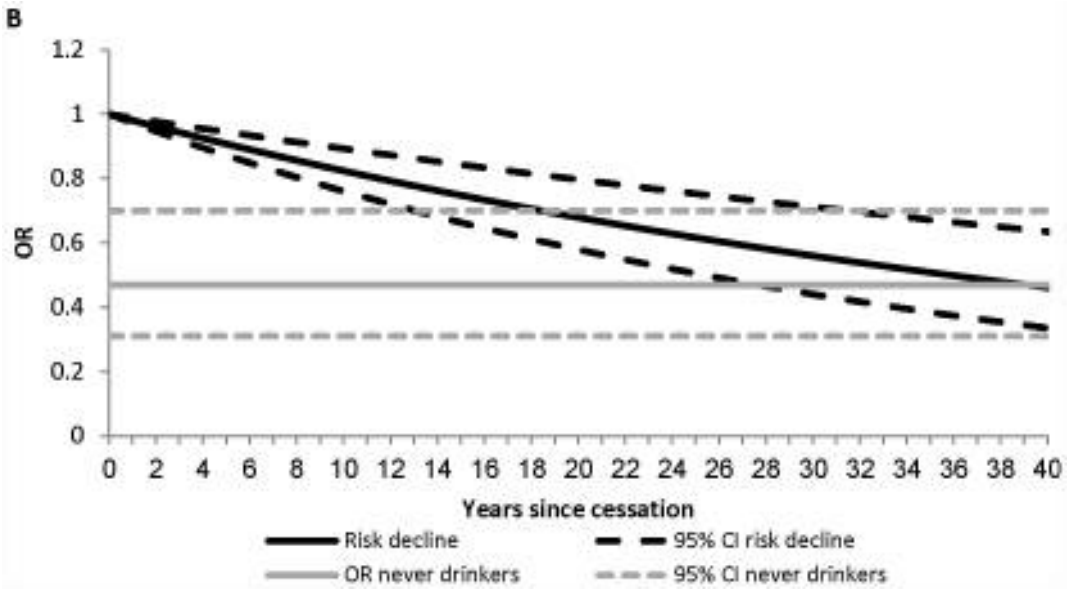
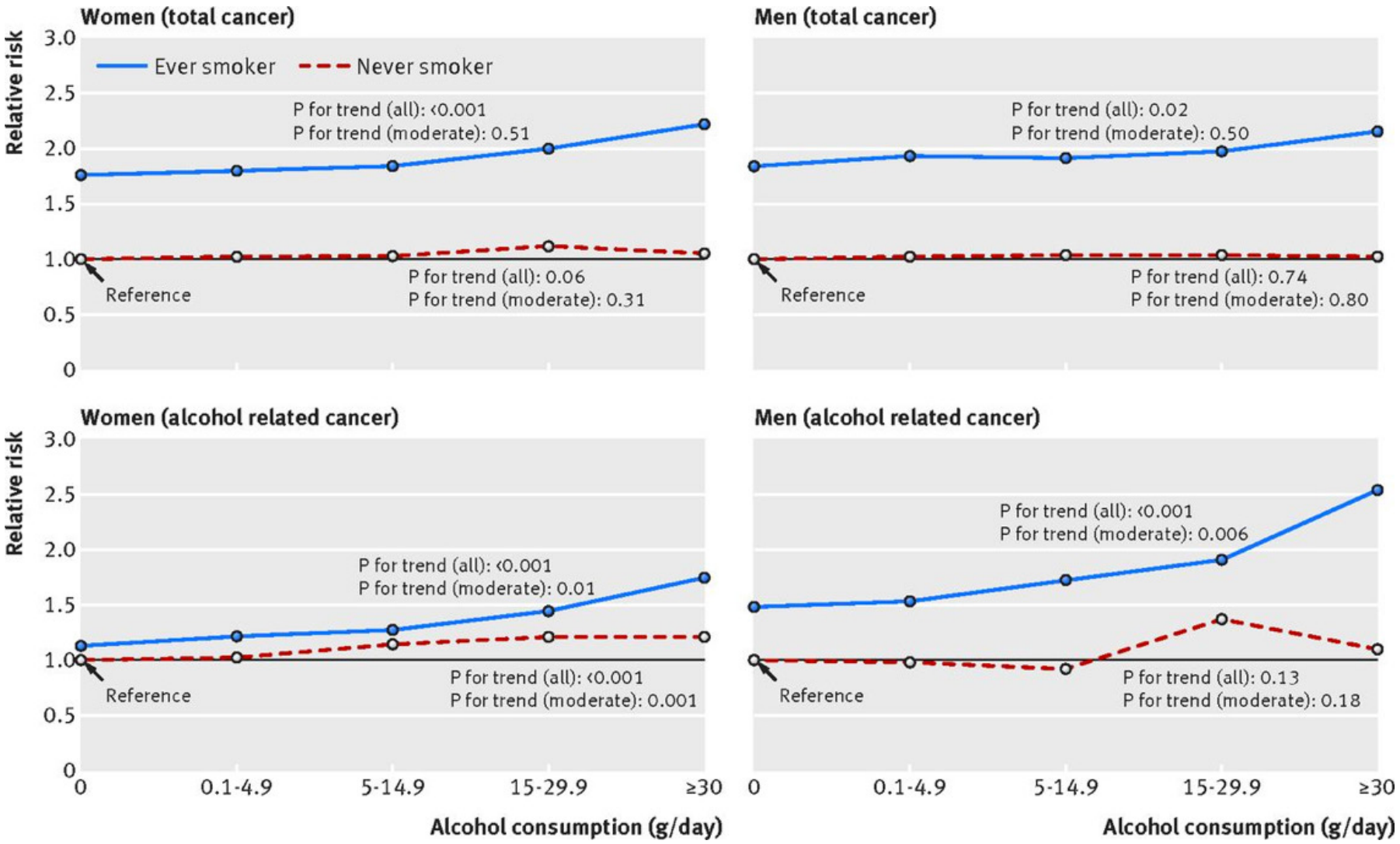


Figure. Risk decline of laryngeal and pharyngeal cancers over a forty-year period after drinking cessation

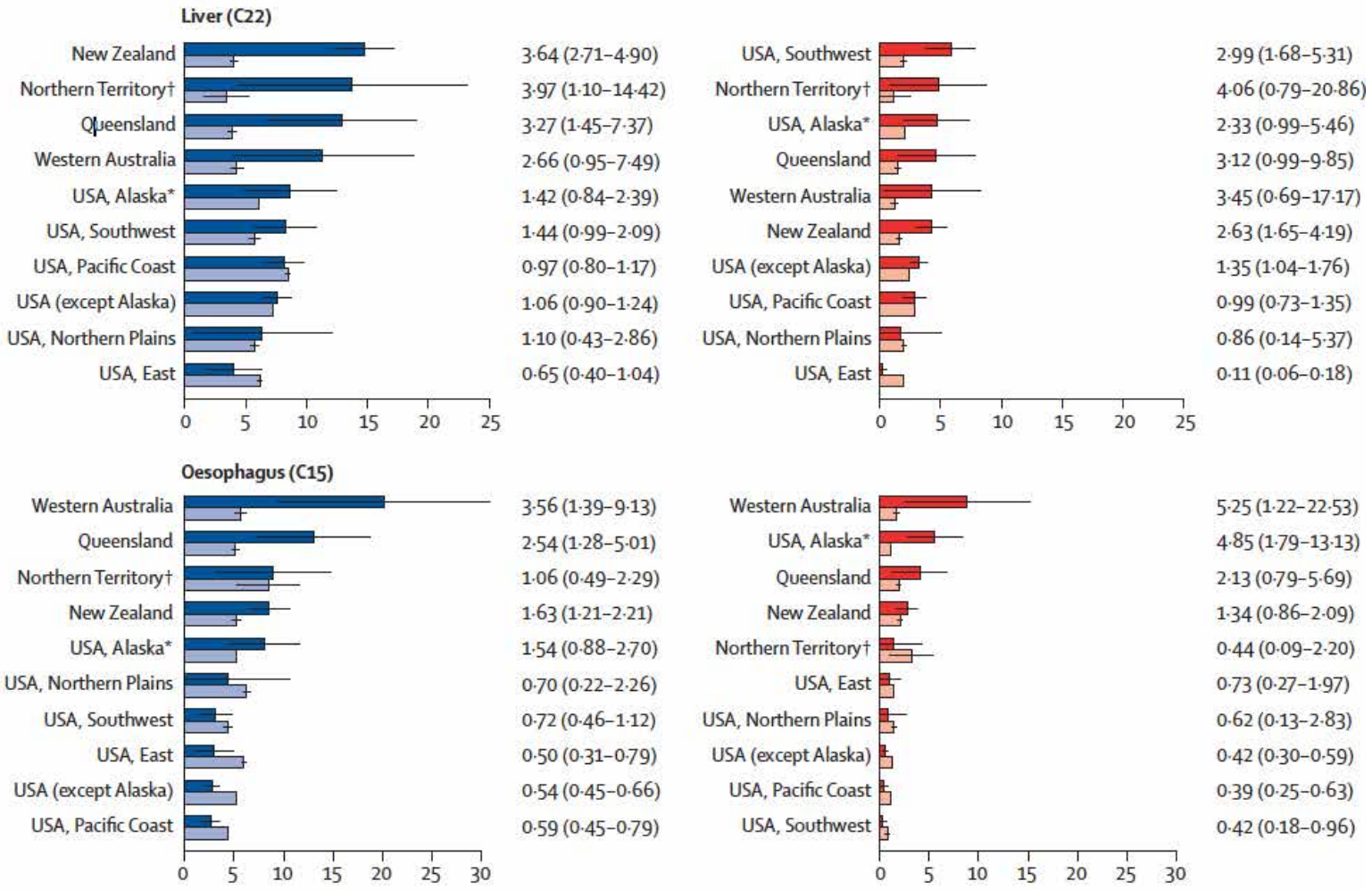
Kiadaliri et al., 2013

Interactions with Other Risk Factors: Smoking



Cao et al., 2016, *BMJ*

Populations at Elevated Risk: Indigenous Populations

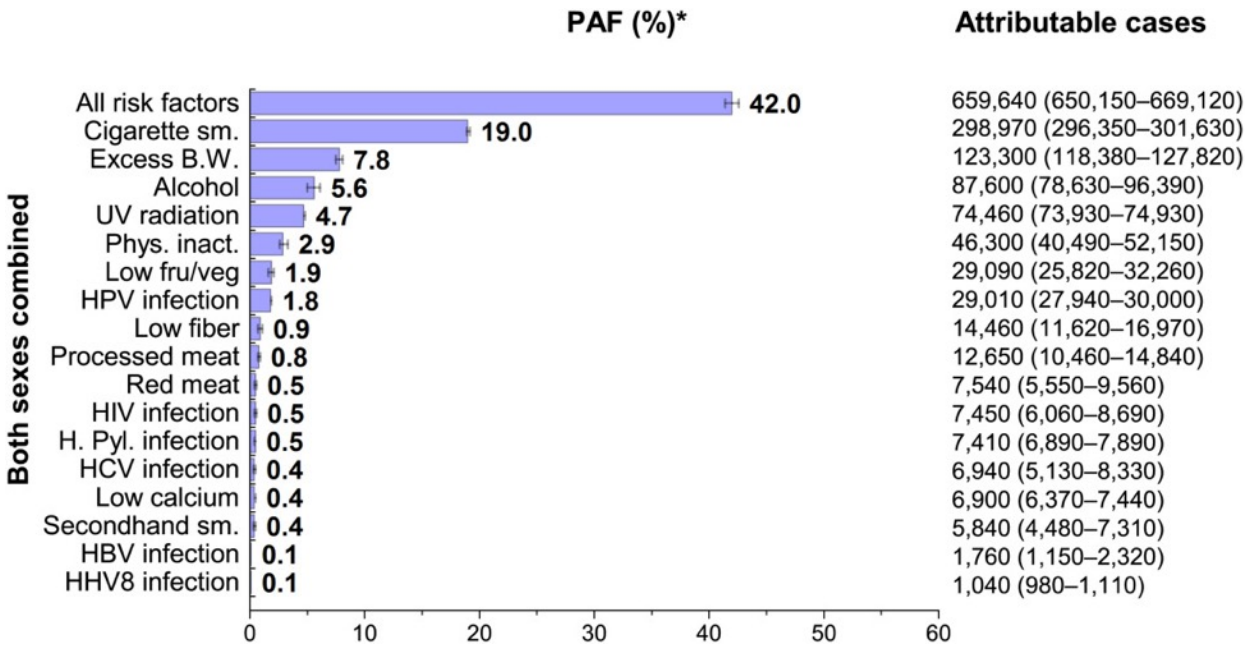


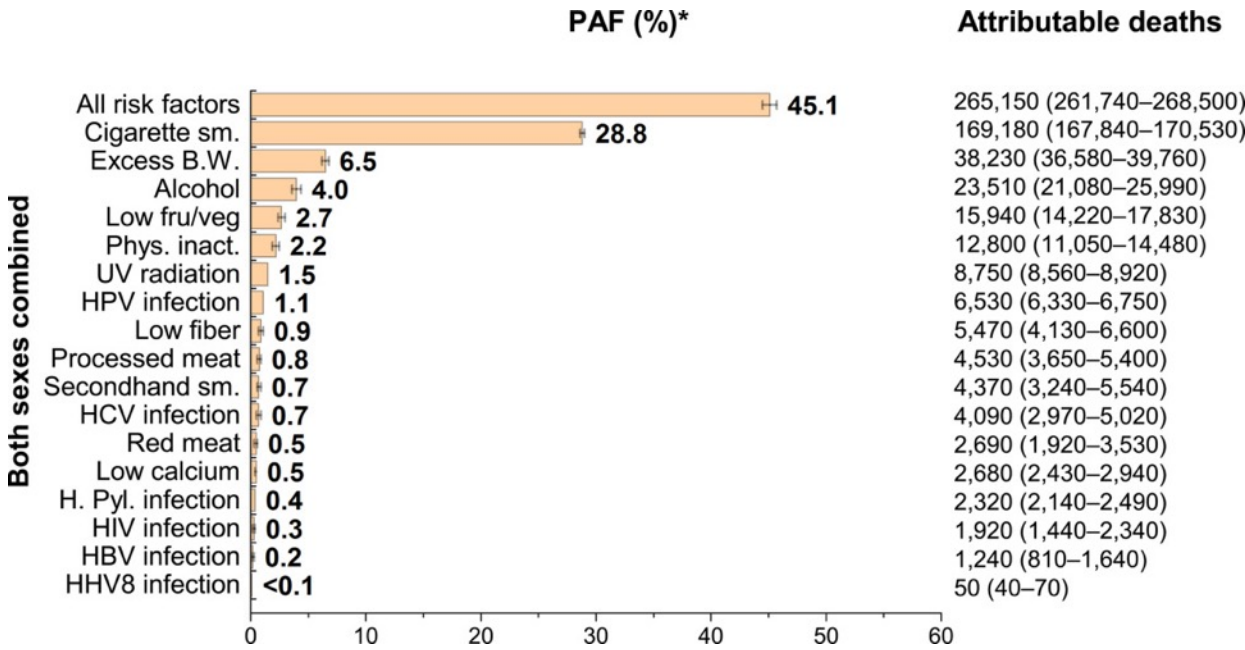
Indigenous women
Non-indigenous women

Indigenous men
Non-indigenous men

Moore et al., 2015

Contribution to the Overall Burden of Disease: United States 2014





Islami et al., CA Cancer J Clin 2018

CANCER	MEN		WOMEN		BOTH SEXES COMBINED	
	ATTRIBUTABLE DEATHS, NO. (95% CI)	PAF (95% CI), %	ATTRIBUTABLE DEATHS, NO. (95% CI)	PAF (95% CI), %	ATTRIBUTABLE DEATHS, NO. (95% CI)	PAF (95% CI), %
Alcohol intake						
Oral cavity, pharynx	3000 (2830-3180)	44.4 (41.9-47.2)	650 (590-710)	24.6 (22.5-27.1)	3640 (3460-3830)	38.9 (36.9-40.9)
Larynx	750 (660-830)	24.5 (21.7-27.3)	90 (80-110)	12.8 (11.1-14.9)	840 (750-920)	22.3 (20.1-24.6)
Liver	3270 (1970-4840)	24.0 (14.5-35.6)	570 (340-860)	10.9 (6.4-16.4)	3840 (2540-5420)	20.4 (13.5-28.8)
Esophagus	1900 (1620-2130)	15.9 (13.6-17.8)	610 (450-750)	20.6 (15.2-25.2)	2510 (2180-2780)	16.8 (14.6-18.6)
Breast	—		6350 (5250-7570)	15.4 (12.8-18.4)	6350 (5250-7570)	15.4 (12.8-18.4)
Colorectum	4460 (2870-6150)	16.3 (10.5-22.4)	1810 (1160-2660)	7.2 (4.6-10.6)	6290 (4590-8100)	12.0 (8.8-15.5)

Islami et al., CA Cancer J Clin 2018

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Dr. Elisa V. Bandera
Professor and Chief, Cancer Epidemiology and Health Outcomes,
Rutgers Cancer Institute of New Jersey

Dr. Kevin Shield
Independent Scientist, Head WHO/PAHO Collaborating Centre
Centre for Addiction and Mental Health, Toronto, Canada

Dr. Vasilis Vasiliou
Department Chair and Susan Dwight Bliss Professor of Epidemiology (Environmental Health Sciences) and of Ophthalmology and Visual Science and of Environment
Yale School of Public Health

Etiology Discussion Topics

1. How do different patterns of consumption (i.e., binge vs. daily of lower amounts; liver “holidays”) or reducing/ceasing drinking affect cancer risk (including early onsets of liver and colon cancer)? How can biologic studies help inform why binge vs. low level consistent consumption affect risk?
2. What is the impact of alcohol consumption at different times of life on cancer risk (including early onsets of liver and colorectal cancer); How does pre-gravid consumption affect risk over time?
3. What is unknown about interactions of alcohol and genetic, lifestyle, environmental and sociodemographic characteristics on cancer? To what extent are the NCI Cohort Consortium, other collaborative efforts, large cohorts or other novel data sources covering these issues?
4. What is the impact of methodological issues in assessing alcohol consumption (underreporting in certain populations, dimensions of alcohol), reverse causation, residual confounding on alcohol-cancer associations? Are there corrections that can be applied to improve measurement?
5. Is there heterogeneity of alcohol-cancer associations by tumor subtype (breast cancer intrinsic subtypes) and tumor location (e.g., for colorectal cancer).
6. How can we better understand the role of alcohol in cancer etiology based on studies of alcohol effects on the immune system, metabolome, epigenome, and microbiome?

Health Effects of Alcohol During and After Treatment

Noelle LoConte, MD

Associate Professor

Division of Hematology, Medical Oncology & Palliative Care

Department of Medicine

University of Wisconsin, Madison

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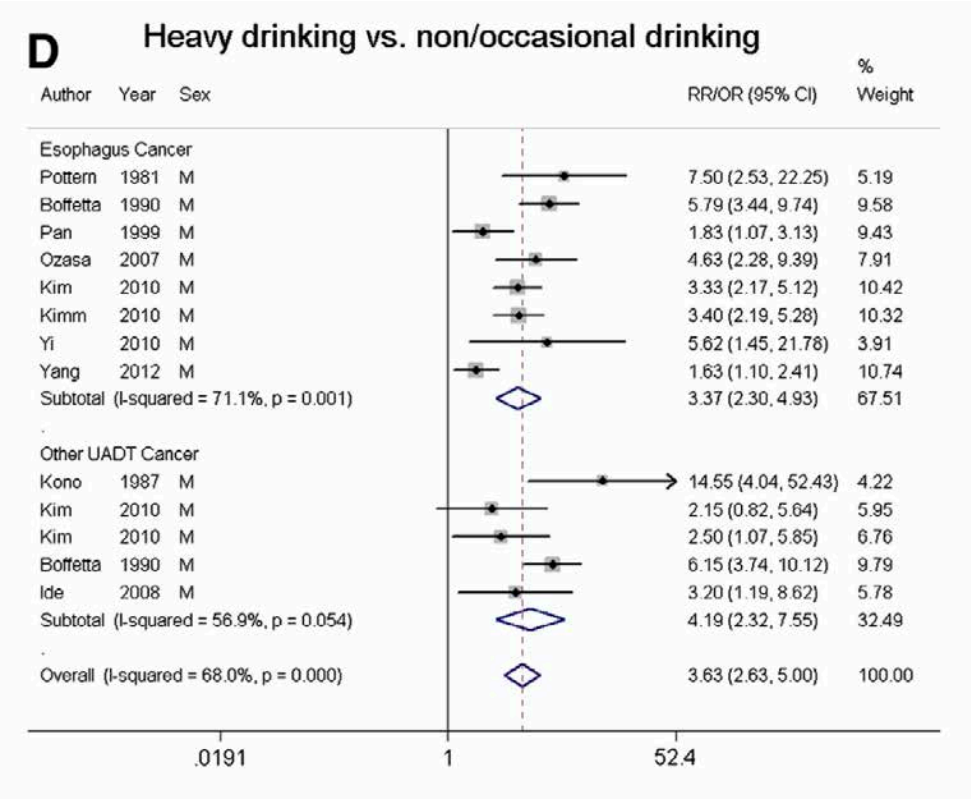
Overview

- Alcohol and its association with cancer outcomes
- Alcohol and its impact on cancer treatment

Head and neck, and esophageal cancer specific mortality



Li Y, Mao Y, et al. Alcohol drinking and upper aerodigestive tract cancer mortality: a systematic review and meta-analysis. Oral Oncol. 2014 Apr;50(4):269-75. Epub 2014 Jan 7. PMID: 24405883.

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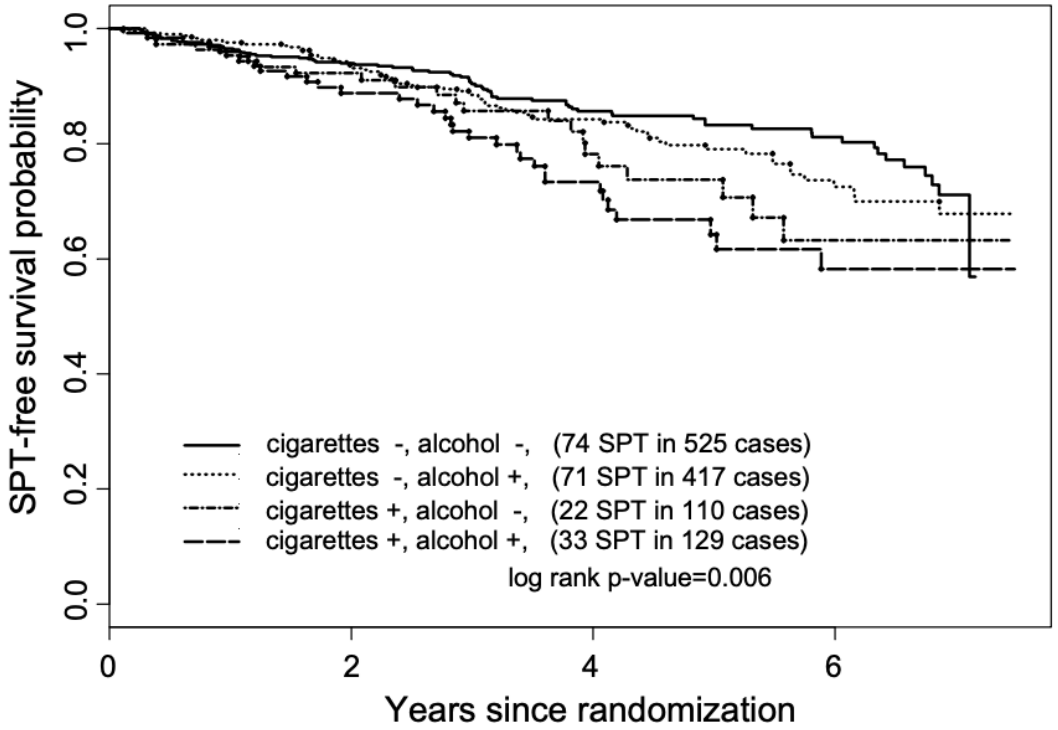
Head and neck cancer – second primary tumors



Do KA, Johnson MM, et al. Second primary tumors in patients with upper aerodigestive tract cancers: joint effects of smoking and alcohol (United States). Cancer Causes Control. 2003 Mar;14(2):131-8.

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Effects on breast cancer recurrence and mortality

Study	N	Special populations	Effect size recurrence
Collaborative Breast Cancer Study	22,980	None	0.85
Danish (Holm)	1,052	>2 drinks/d	1.65 (p=0.04)
After Breast Cancer Pooling Project	9,329	None	0.83 (NS)
After BrCa Pooling Project	7,027	ER+, postmeno	1.19

Li Y, Oral Oncol, 2014, MacDonald, Curr Breast Cancer Rep 2014. Newcomb JCO 2013. Kwan Cancer Epidemiol Biomarkers Prev 2014. Holm, International Journal of Cancer 2012.

Breast cancer specific recurrence (mortality)

Parameter	<6 g/d	>/= 6 g/d	P value
Premenopausal	1.01	1.25	0.52 (0.61)
Postmenopausal	1.12	1.51	0.03 (0.04)
Normal BMI 1year predx	0.81	1.09	0.47 (0.50)
Overweight/obese	1.27	1.60	0.03 (0.04)
ER positive	1.00 (1.04)	1.23 (1.48)	0.19 (0.08)
ER negative	1.29 (1.38)	2.00 (1.62)	0.07 (0.43)

Kwan ML, Kushi LH, Weltzien E, et al. Alcohol consumption and breast cancer recurrence and survival among women with early-stage breast cancer: the life after cancer epidemiology study. *J Clin Oncol*. 2010;28(29):4410-4416.

Breast cancer – contralateral breast tumors

Table 3. Joint Effects of Alcohol Consumption and Smoking on Risk of Contralateral Breast Cancer

Parameter	Controls (n = 567)		Patients With Contralateral Breast Cancer (n = 263)		Odds Ratio*	95% CI
	No.	%	No.	%		
Alcohol consumption and smoking at first breast cancer diagnosis						
0-6.9 drinks/week and never/former smoker	416	73.4	185	70.3	1.0	Reference
0-6.9 drinks/week and current smoker	70	12.4	35	13.3	1.4	0.8 to 2.4
≥ 7 drinks/week and never/former smoker	65	11.5	27	10.3	0.9	0.5 to 1.8
≥ 7 drinks/week and current smoker	16	2.8	16	6.1	3.7	1.4 to 9.8†
P for interaction				.078		
Alcohol consumption and smoking at reference date						
0-6.9 drinks/week and never/former smoker	445	78.5	197	74.9	1.0	Reference
0-6.9 drinks/week and current smoker	49	8.6	23	8.8	1.5	0.8 to 2.8
≥ 7 drinks/week and never/former smoker	64	11.3	29	11.0	1.2	0.6 to 2.1
≥ 7 drinks/week and current smoker	9	1.6	14	5.3	7.2	1.9 to 26.5†
P for interaction				.047		

*Odds ratios and 95% CIs were estimated using conditional logistic regression and are implicitly adjusted for each of the matching variables (age and year of first breast cancer diagnosis, county, race/ethnicity, stage, and survival time). Risk estimates are additionally adjusted for use of adjuvant hormone therapy, chemotherapy, body mass index at reference date, and first degree family history of breast cancer.
†$P < .05$.

Li, Christopher I., et al. "Relationship between potentially modifiable lifestyle factors and risk of second primary contralateral breast cancer among women diagnosed with estrogen receptor–positive invasive breast cancer." *Journal of Clinical Oncology* 27.32 (2009): 5312.

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Colorectal cancer

Study	Design	N	DFS with heavy drinking
German	Cohort, interview	511 v 248	1.32 (1.05-1.66)
Seattle Colon Cancer Family Registry	Telephone interview to incident cases in tumor registry	2264	1.02 (0.78-1.32)
Seattle Colon Cancer Family Registry	Telephone interview to incident cases in tumor registry	4966	Wine 0.90 (0.68-1.22) Beer 1.01 (0.84-1.22) Liquor 0.94 (0.73-1.21)
Schwedhelm et al	Meta-analysis	209,597	1.17 (1.05-1.31)
N0147	Randomized phase III trial (FOLFOX vs FOLFOX/cetuximab), food questionnaire prior to treatment	1,984	Wine 0.68 (0.45-1.04) Beer 0.81 (0.60-1.09) Liquor 1.00 (0.66-1.52)

Walter V, et al. Am J Clin Nutr. 2016 Jun;103(6):1497-506; Phipps AI, et al. Cancer. 2011 Nov 1;117(21):4948-57; Phipps AI, et al. Cancer. 2017 May 15;123(6):1035-1043; Schwedhelm C, et al.. Nutr Rev. 2016 Dec;74(12):737-748; Phipps AI, et al. *Int J Cancer*. 2016;139(5):986-995.

All cancer survival

Table 3 **Risk of cancer recurrence comparing the highest vs lowest category of pre-/postdiagnosis dietary exposure (random effects analyses data only)**

Exposure	No. of studies	Risk ratio (95%CI)	I^2 (95%CI)
Prudent/healthy dietary pattern	4	0.87 (0.68–1.11)	24% (0–88%)
Postdiagnosis	3	0.94 (0.71–1.24)	19% (0–92%)
Western dietary pattern	4	1.21 (0.69–2.13)	81% (51–93%)
Postdiagnosis	3	1.34 (0.61–2.92)	85% (54–95%)
Vegetable consumption	3	0.99 (0.74–1.33)	69% (0–91%)
Alcohol consumption	17	1.17 (1.05–1.31)	38% (0–65%)
Breast cancer	7	1.21 (1.06–1.39)	23% (0–66%)
Hepatocellular carcinoma	4	1.34 (0.73–2.46)	73% (25–90%)
Postdiagnosis	4	1.31 (1.04–1.66)	54% (0–85%)
Tea consumption	3	0.76 (0.58–1.01)	0% (0–90%)

Schwedhelm C, Boeing H, et al. Effect of diet on mortality and cancer recurrence among cancer survivors: a systematic review and meta-analysis of cohort studies, *Nutrition Reviews*, Volume 74, Issue 12, December 2016, Pages 737–748.

Alcohol and the cancer patient

- 2007-2017 National Health Interview Survey of adults with cancer: 56% reported using alcohol and 34% exceeded moderate limits
- Alcohol abuse is associated with comorbid psychiatric conditions which affects cancer treatment adherence and quality of life
- Heavy alcohol use is predictive of malnutrition and increased susceptibility to bacterial infections with poorer outcomes

Sanford NN, J Natl Compr Cancer Network, 2020
Lundberg JC, psycho-oncology. 6:253-266, 1997
Szabo G et al. Am J Gastroenterol. 92:485-489, 1997

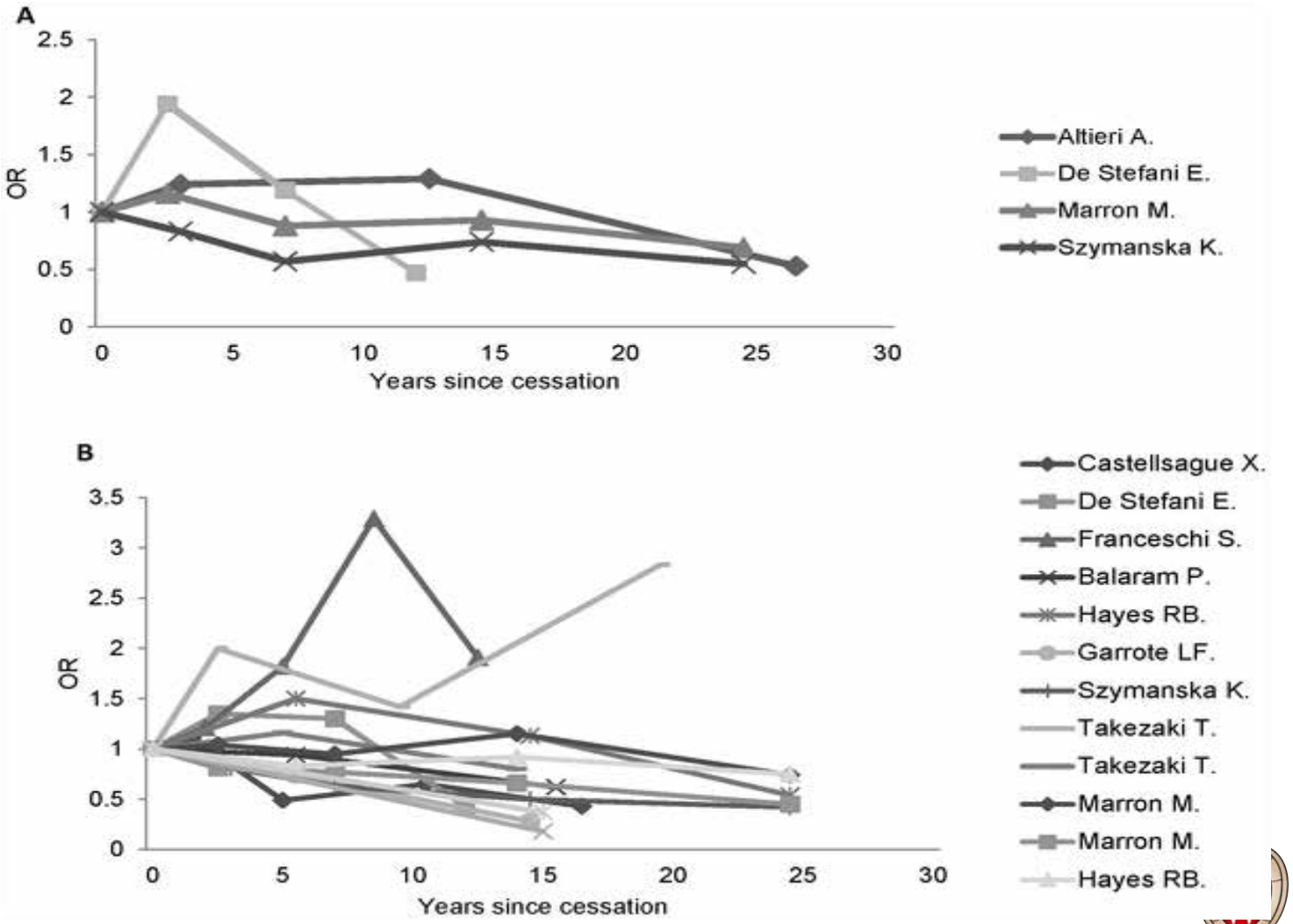
Alcohol and impact on cancer treatment

- Heavy alcohol use is associated with post operative complications, poorer surgical outcomes and longer hospitalizations
- Heavy drinkers have increased comorbidities e.g. cardiovascular risk, liver dysfunction that can complicate systemic treatment choices and guideline adherence
- Smoking and alcohol use during and after radiation for oropharyngeal cancer have been associated with increased risk of osteoradionecrosis of jaw

Tønnesen H et al. Lancet 340:334-337, 1992
Mostofsky E et al. Circulation 133:979-987, 2016
Owosho AA et al. Oral Oncol 64:44-51, 2017

Is there a benefit to alcohol cessation on cancer outcomes?

Meta Analysis of Alcohol Cessation and Risk of Laryngeal and Pharyngeal Cancers



Kiadaliri et al. Plos One, 2013

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What is the oncologist's role in counselling patients about heavy alcohol use?

- A cancer diagnosis is a teachable moment for risk-reduction health behaviors – 30% of participants of head and neck 5000 clinical cohort lowered alcohol use post diagnosis
- Patients' perceptions of negative effects of continued alcohol use and receipt of counseling on alcohol use are associated with increased chance of decreased use after diagnosis
- Interventions for heavy drinking in the primary care setting have been effective at decreasing alcohol use
- Heavy alcohol use associated with health outcome risks e.g. cardiovascular disease, liver disease, accidents which affect non-cancer related mortality

Penfold CM et al. Head Neck. 40: 1389-1399, 2018
Eng L et al. European Journal of Cancer Care, 28, 2018
Reid MC et al. Arch Intern Med.159:1681-1689, 1999

During/after Treatment Discussion Topics

1. Characterize pre- and post-diagnosis drinking (and change in drinking from pre-to post) among survivors (i.e., impact of a cancer diagnosis on alcohol consumption)
2. Further characterize associations of pre- and post-diagnosis (and change in drinking from pre-to post) on prognosis (disease specific mortality vs. overall mortality) and patient-reported outcomes (e.g., quality of life, sleep, fatigue, neuropathy)
3. How does ongoing alcohol use affect chemotherapy tolerance, side effects, treatment efficacy, and guideline concordant treatment? What is the effect on radiation and oncologic surgery treatment?
4. What is the optimal way for physicians and other providers to ask about alcohol use? What is the optimal electronic health record-based screening tool? What are the weaknesses for assessing alcohol use in currently available datasets?
5. What is best practice about helping cancer patients cut down on their drinking?
6. Cross cutting issue: COVID-19 effects of alcohol use? Highlight for the effect on women?

Effective Policies Relevant to Reducing the Health Effects of Alcohol Consumption

Timothy Naimi, MD, MPH

Director

Canadian Institute for Substance Use Research

University of Victoria

Alcohol Policies and Cancer

National Cancer Institute:
Alcohol and Cancer Webinar

December 8-10, 2020

Timothy S. Naimi M.D., M.P.H.
Director, Canadian Institute for Substance Use Research (CISUR)
Professor, Department of Public Health and Social Policy
University of Victoria, Victoria, BC, Canada

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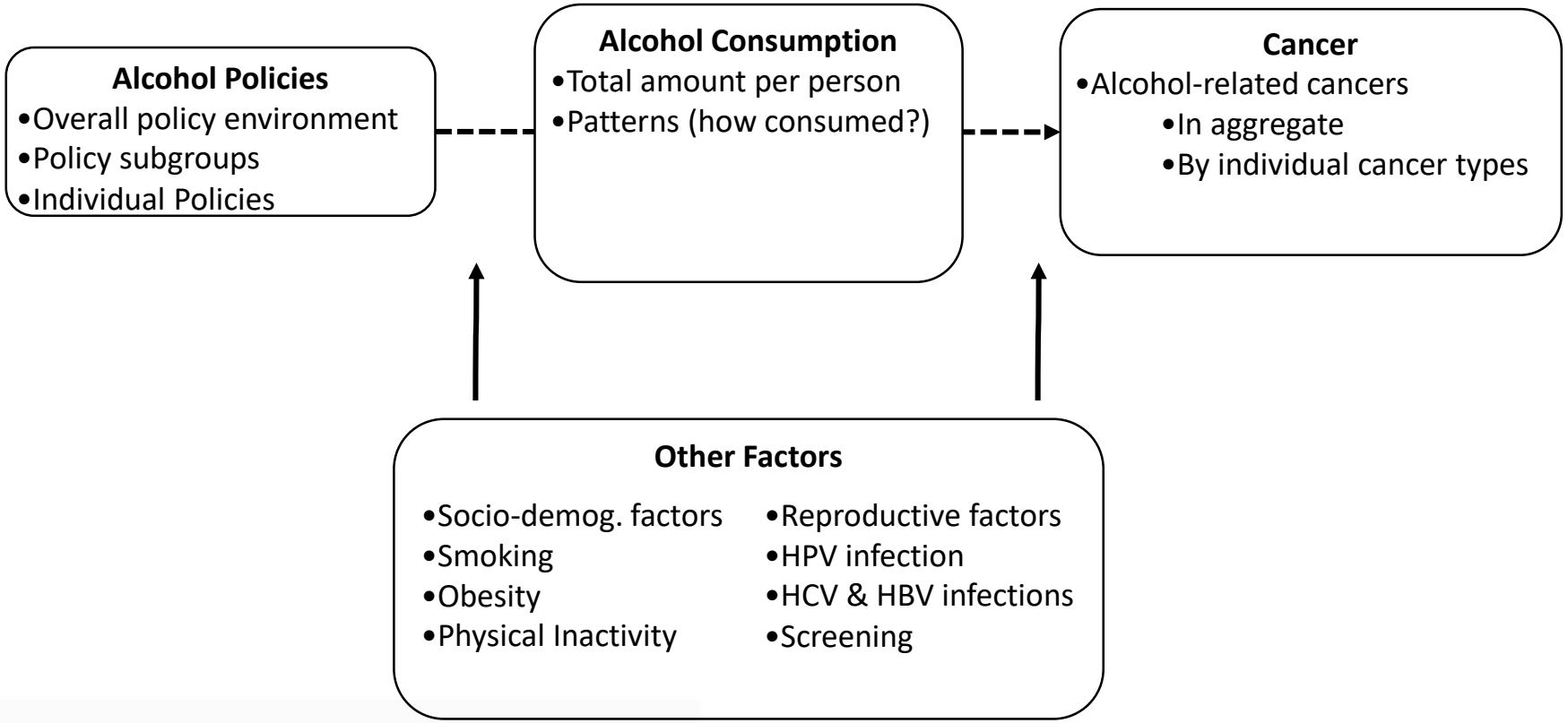
Alcohol Policies and Cancer: Conceptual Framework



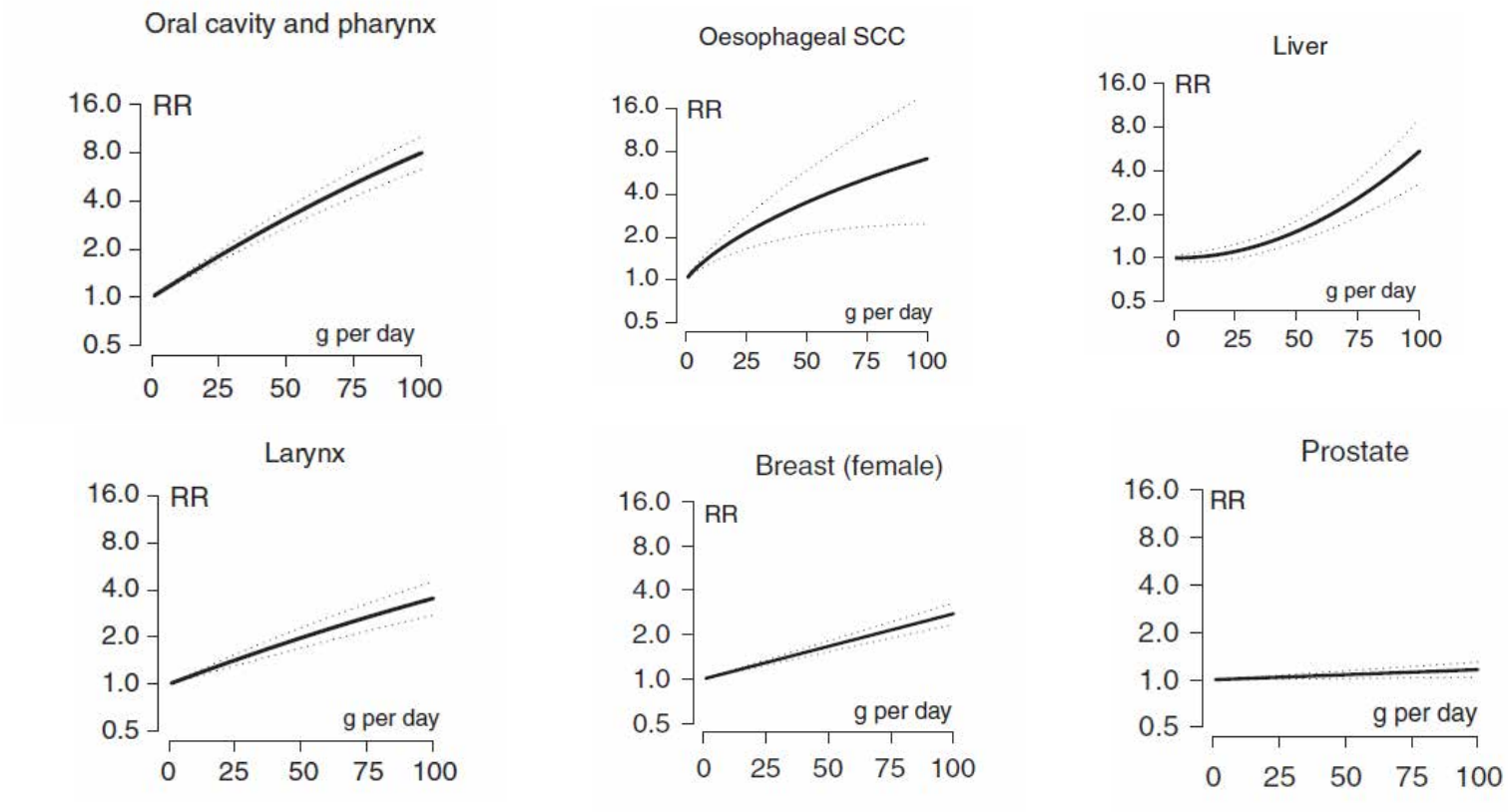
Effective Alcohol Policies: Community Guide Recommendations

- Increase alcohol taxes
- Regulate alcohol outlet density
- Dram shop (commercial host) liability
- Avoid privatization of alcohol sales
- Maintain limits on days of sale
- Maintain limits on hours of sale
- Enhance enforcement of laws prohibiting alcohol sales to minors

What works: WHO list of most effective and cost-effective interventions

- Alcohol taxes and other price controls
- Regulate physical availability through restrictions on time, place, and density of alcohol outlets
- Regulate alcohol advertising and other marketing

Alcohol Consumption and Risk of Cancers: Meta-analysis of Individual-level Risk



Bagnardi et al, 2015

Alcohol Consumption and Cancer: Population-level Data

- Individual-level consumption risk → **alcohol-*attributable*** cancers in population, using population attributable fraction (indirect) methods

- Population-level alcohol consumption → ***alcohol-related*** cancer mortality in population (less evidence)

Nelson DE, Jarman DW, Rehm J, et al. Alcohol-attributable cancer deaths and years of potential life lost in the United States. *Am J Public Health.* 2013;103:641-648. PMCID: PMC3673233.

Canadian Substance Use Costs and Harms Scientific Working Group. *Canadian substance use costs and harms (2007-2014).* Ottawa, ON: Canadian Centre on Substance Use and Addiction;2018.

Schwartz N, Nishri D, Chin Cheong S, Giesbrecht N, Klein-Geltink J. European Journal of Cancer Prevention. 2019 Jan 1;28(1):45-53.

Alcohol Policies and Cancer

- If alcohol policies affect consumption, and consumption can affect cancer, alcohol policies can affect certain cancers
- Modeling studies quantify this for taxes
- What about aggregate measures of alcohol policy?

Xuan Z, Blanchette JG, Nelson TF, et al. Youth drinking in the United States: relationships with alcohol policies and adult drinking. *Pediatrics.* 2015;136(1):18-27. PMC4485013.

Xuan Z, Chaloupka FJ, Blanchette J, et al. The relationship between alcohol taxes and binge drinking: evaluating new tax measures incorporating multiple tax and beverage types. *Addiction.* 2015;110:441-450. PMC4441276.

Xuan Z, Nelson TF, Heeren T, et al. Tax policy, adult binge drinking, and youth alcohol consumption in the United States. *Alcohol Clin Exp Res.* 2013;37(10):1713-1719. PMC3795905.

Wagenaar AC, Salois MJ, Komro KA. Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. *Addiction.* 2009;104:179-190.

Wagenaar AC, Tobler AL, Komro KA. Effects of alcohol tax and price policies on morbidity and mortality: a systematic review. *Am J Public Health.* 2010;100:2270-2278.

Alcohol Policies and Alcohol-attributable Cancer Mortality in the United States

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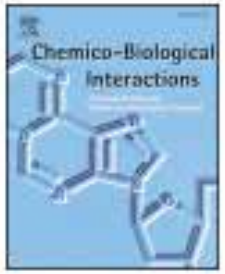

Alcohol policies and alcohol-attributable cancer mortality in U.S. States

Maha Alattas[a], Craig S. Ross[b,c], Elizabeth R. Henehan[b,c], Timothy S. Naimi[a,b,c,*]

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[b] Department of Epidemiology, Boston University School of Public Health, 715 Albany St, Boston, 02118, MA, USA
[c] Department of Community Health Sciences, Boston University School of Public Health, 715 Albany St, Boston, 02118, MA, USA

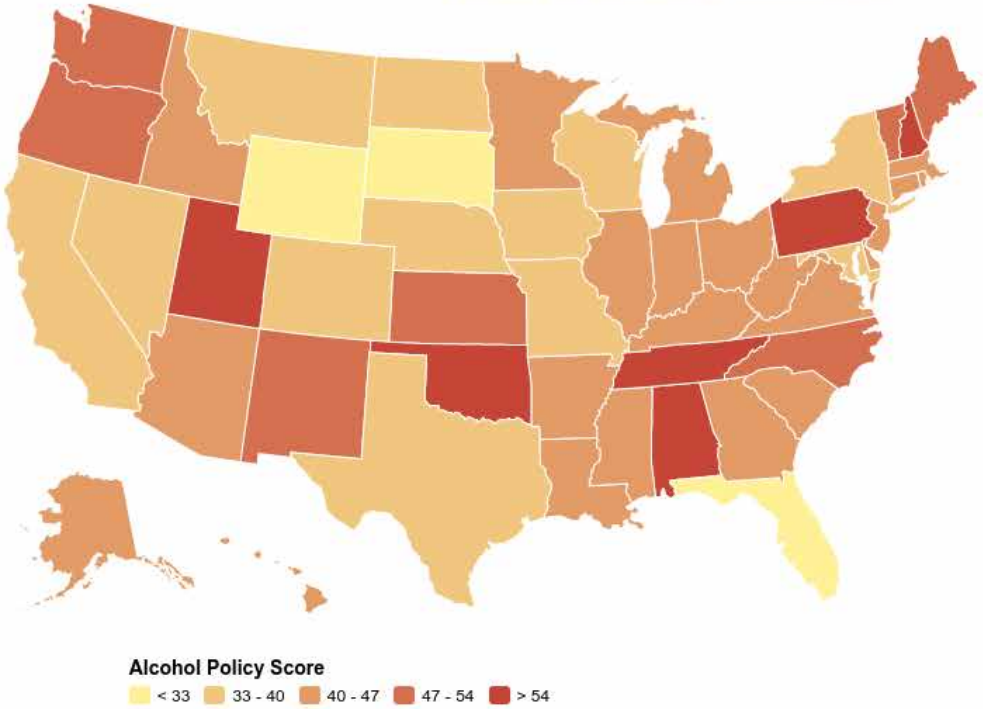
Study:

- Alcohol Policy Scales (APS) scores, U.S. states (29 policies weighted by efficacy, implementation)
- Related state APS scores to annual alcohol-attributable deaths for 6 cancer types in US states

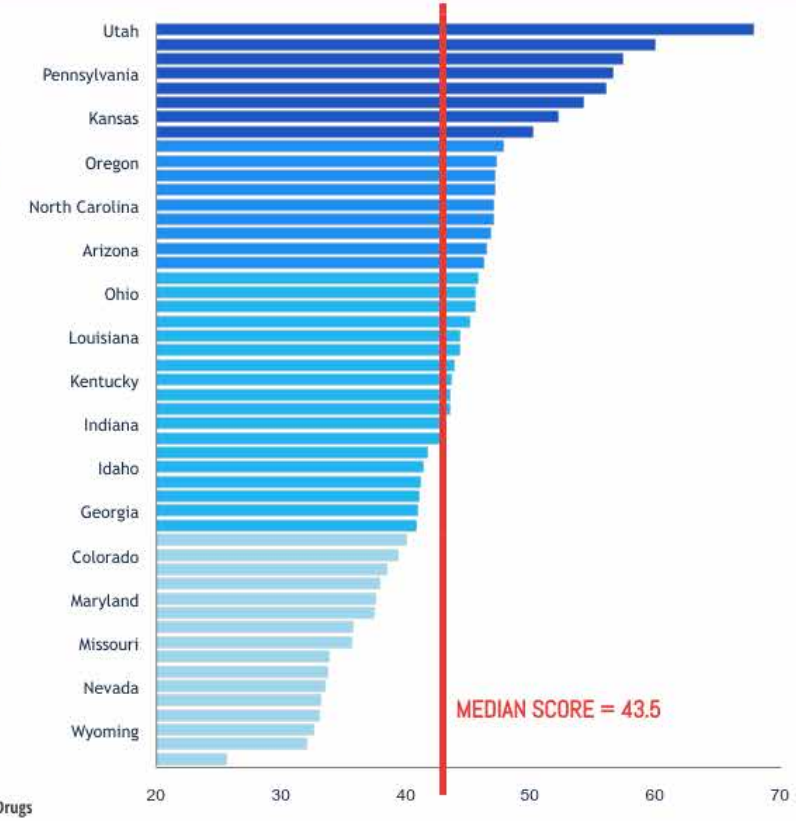
Naimi TS, Blanchette J, Nelson TF, et al. A new scale of the U.S. alcohol policy environment and its relationship to binge drinking. *Am J Prev Med*. 2014;46(1):10-16. doi:10.1016/j.amepre.2013.07.015
Hadland SE, Naimi TS, Swahn MH, et al. Alcohol Policies and Alcohol-Related Motor Vehicle Crash Fatalities Among Young People in the US. *Pediatrics*. 2017;139(3):e20163037. doi:10.1542/peds.2016-3037

ALCOHOL POLICY SCORES *Changes Over Time*

2018 SCORES & RANKING

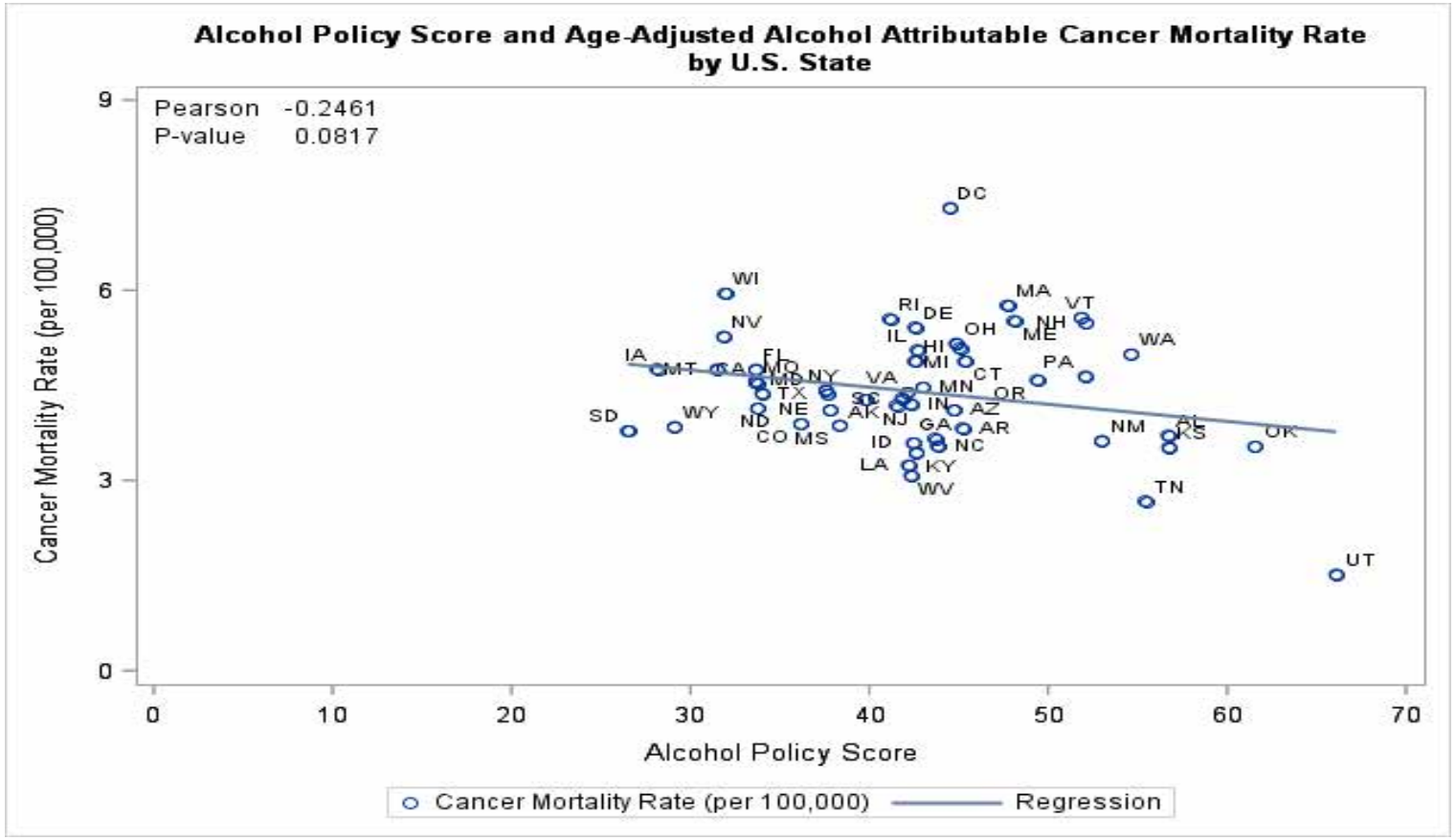


Ranked from Highest to Lowest



Blanchette, Jason & Lira, Marlene & Heeren, Timothy & Naimi, Timothy. (2020). Alcohol Policies in U.S. States, 1999–2018. Journal of Studies on Alcohol and Drugs

Alcohol Policies and Alcohol-Attributable Cancer Mortality



University of Victoria | Canadian Institute for Substance Use Research | Institut canadien de recherche sur l'usage de substances

Associations between 10% difference in APS score and relative difference in alcohol-attributable cancer mortality rates

Cancer Types	Total	Women	Men
Six Types Combined	-8.5%*	*	*
Breast Cancer	n/a	-7.3%	n/a
Esophageal Cancer	-4.4%		
Laryngeal Cancer	-9.2%		
Liver Cancer	-7.7%*	*	*
Oropharyngeal Cancer	-8.3%*		*
Prostate Cancer	n/a	n/a	-8.5%*

* significant alpha 0.05

Alattas M, Ross CS, Henehan ER, Naimi TS. Alcohol policies and alcohol-attributable cancer mortality in US States. Chemico-Biological Interactions. 2020 Jan 5;315:108885.

Change in Policy Subgroups Over Time, U.S. States

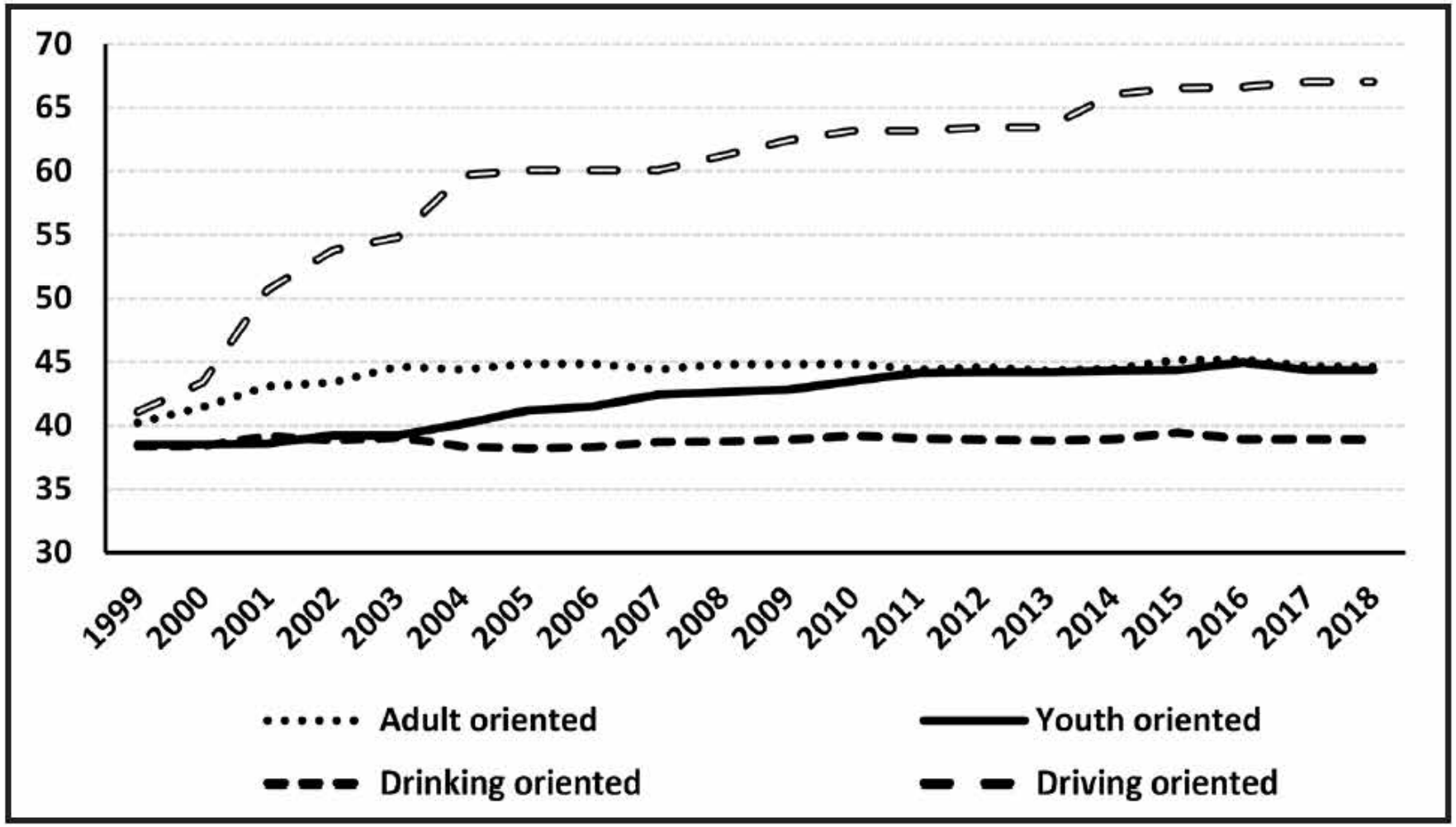


FIGURE 3. Change in median scores for state alcohol policy subgroups, 1999–2018. Lines consist of two sets of

Unive
of Vict

Change in State Alcohol Taxes, U.S.

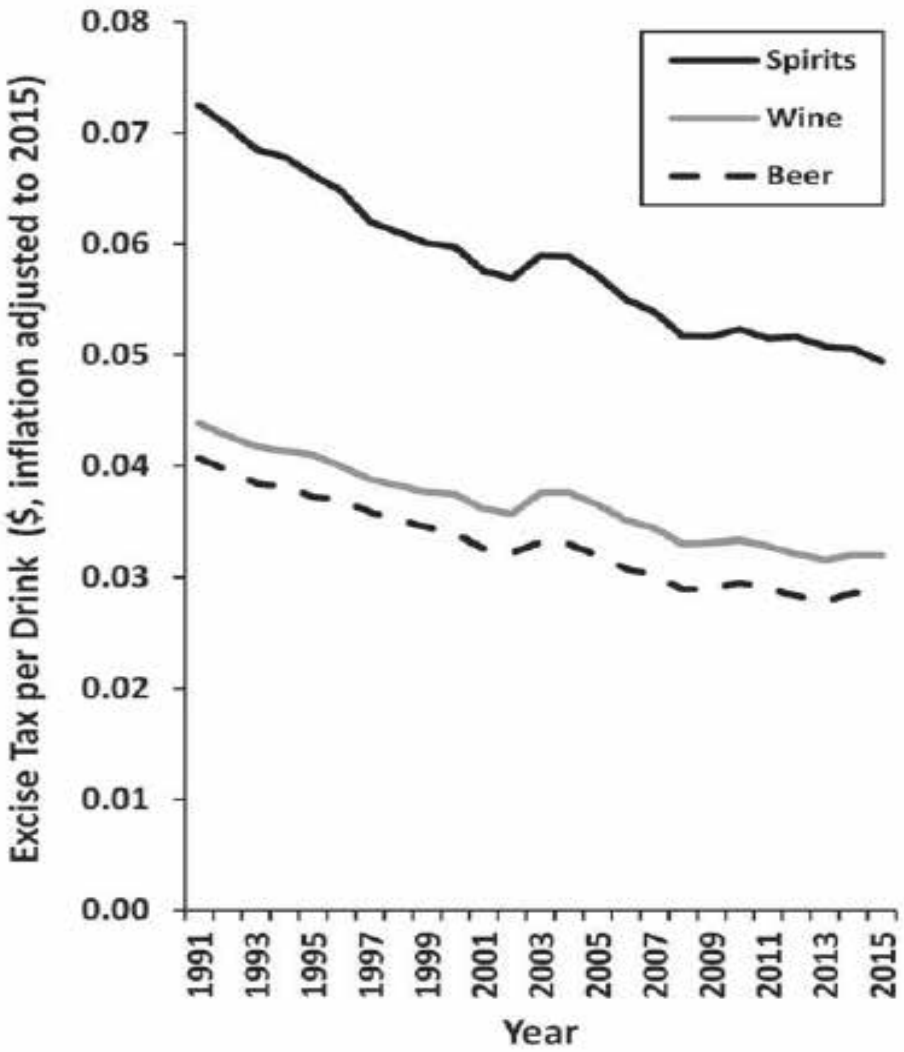


FIGURE 1. Average U.S. state alcohol specific excise tax rates per standard drink, inflation adjusted to 2015 dollars, by beverage type, 1991–2015. The

Summary

- Alcohol policies affect alcohol consumption
- Alcohol consumption affects cancers
- Changing policies is the cornerstone of a public health approach to cancer prevention
- Changing alcohol policies is difficult
- Additional research about policy-cancer relationships would be helpful for science, policy development

Acknowledgements

- NIH Grant support: RO1AA018377, R01AA023376

- Co-authors:
  - Maha Alattas
  - Elizabeth Henehan
  - Craig Ross

- Presentation doesn't represent views of NCI, NIAAA or NIH

Policy Discussion Topics

1. What more do we need to know?
   - Do we need longitudinal research on the relationship between specific policies and policies in combination on cancer incidence, prevalence and survivorship?
   - What types of modeling studies are needed to estimate policy effects on cancer?
2. What are the translational science needs – cost studies, economic effects, policy coherence within larger non-communicable disease (NCD) framework, role of women and low and middle income (LMI) communities and countries to enhance policies to reduce alcohol consumption?
3. What are the research gaps that, if filled, would be helpful to the efforts of the non-governmental organization (NGO) community?

Designing Public Communication Efforts to Address Alcohol and Cancer Risk

Courtney Scherr, PhD

Assistant Professor

Center for Communication and Health

Department of Communication Studies

Northwestern University

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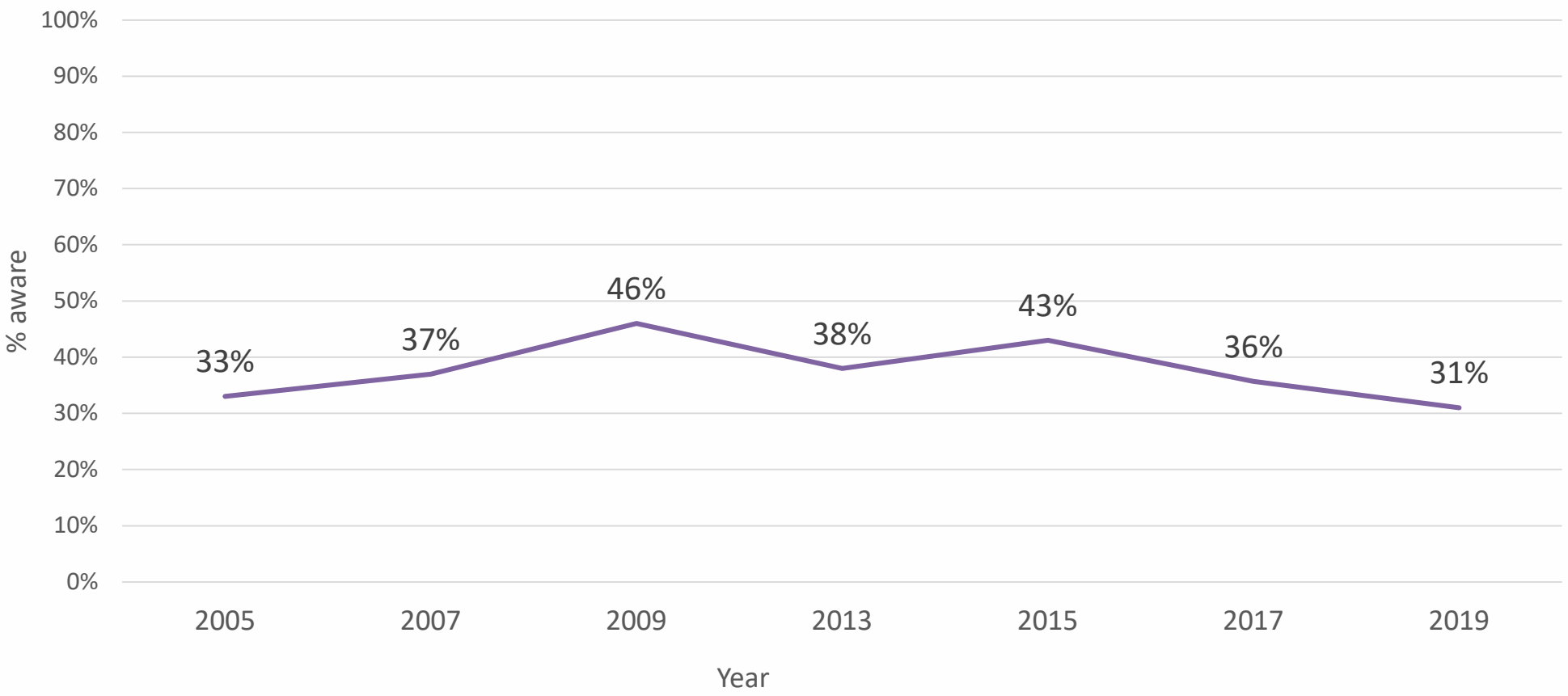
Awareness of the Association between Alcohol Consumption and Cancer in the U.S.



Health Information National Trends Survey; https://hints.cancer.gov/data/download-data.aspx; Scheideler JK & Klein, WMP (2018) Cancer Epidemiology, Biomarkers & Prevention

Correlates of Awareness

Previous Correlates

- Personal cancer history
- Family cancer history
- Sex
- Smoking Status
- Age
- Education

Possible Correlates

- Employment Status
- Race/Ethnicity
- Health self-efficacy
- Cancer Worry
- Cause ambiguity
- Cancer fatalism
- Information seeking

Wiseman, KP & Klein, WMP (2019) Cancer Epidemiology, Biomarkers & Prevention

Correlates of Awareness

Previous Correlates

Age: “don’t know”

- 18 – 39 years; OR = 0.47 (0.23 – 0.95)
- 40 – 49 years; OR = 0.63 (0.40 - 0.97)

Possible Correlates

Self efficacy: “don’t know”

- Somewhat/not; OR = 2.32 (1.30-4.14)
- Very; OR = 2.07 (1.37-3.14)

Cause ambiguity: “yes”

- OR = 1.61 (1.08 – 2.42)

Information seeking: “yes”

- OR = 1.80 (1.27-2.57)

*Referent outcome group was “No”

Wiseman, KP & Klein, WMP (2019) Cancer Epidemiology, Biomarkers & Prevention

International Efforts to Increase Awareness

Adapting, implementing & evaluating strategies from anti-tobacco campaigns

Testing WHO recommended strategy of container labeling

Gain support for policies

Change beliefs, attitudes & behavior

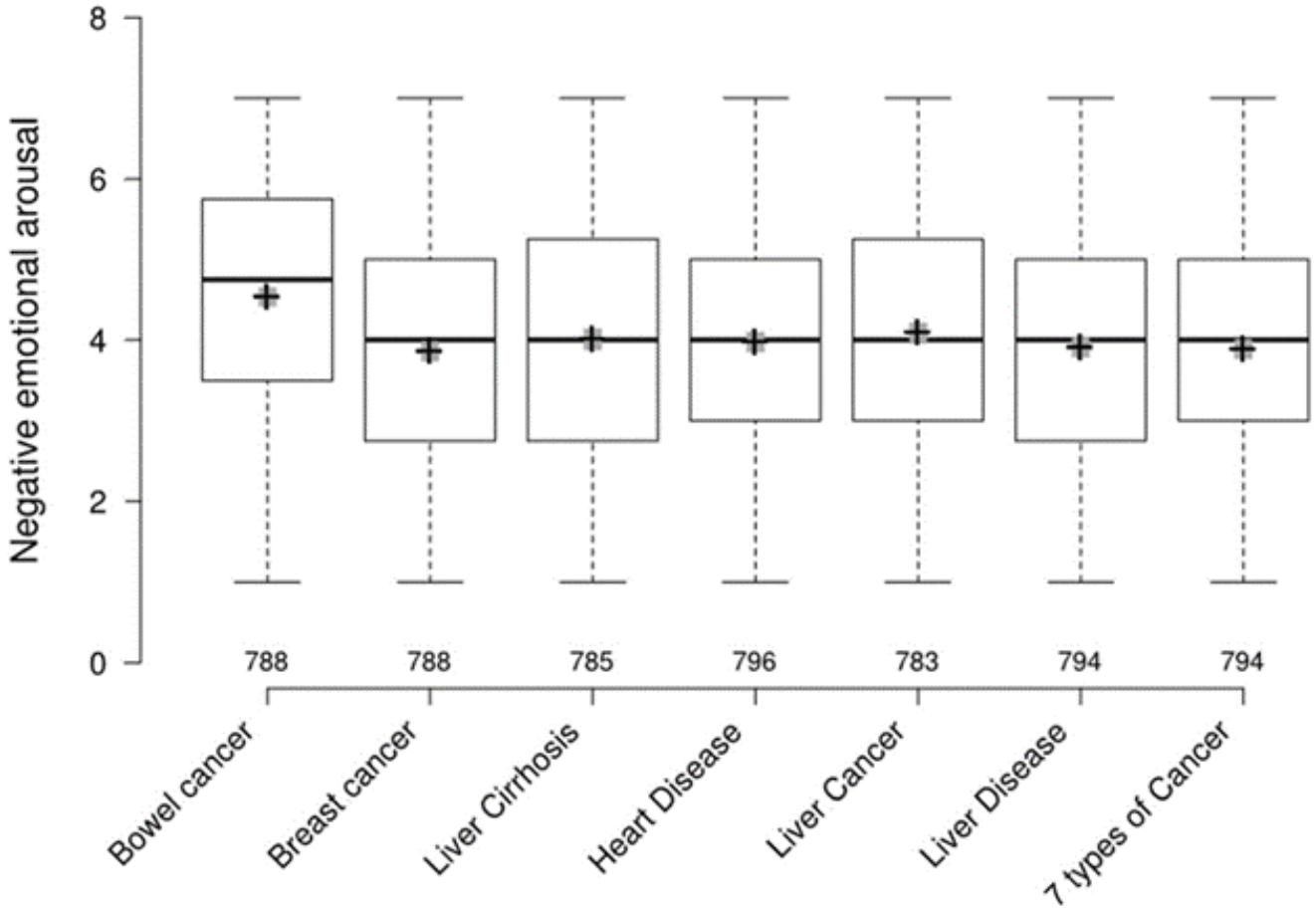
World Health Organization, 2017

“Alcohol does something to us”

	Pre-campaign (*n* = 3000)	Post-campaign (*n* = 3000)	*p*-value
Unprompted awareness	22.2%	27.0%	<0.001
Prompted awareness	44.8%	49.7%	<0.001
Support min. unit pricing	25.7%	31.0%	<0.001
Support ad. bans	40.7%	44.1%	<0.01
Support nutrition labeling	43.9%	47.5%	<0.01
Males only	**(*n* = 1500)**	**(*n* = 1514)**	
18 year age limit	42.5%	51.8%	<0.001
Age limit on schools	44.2%	53.8%	<0.001
Enforcement of age limits	62.9%	67.4%	<0.001

Christensen, ASP, Meyer, MKH, Dalum, P & Krarup, AF (2019) Preventive Medicine

Warning Labels

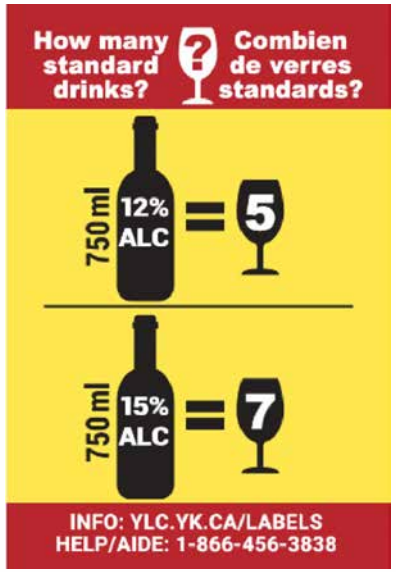


Pechey, E et. al. (2020) BMC Public Health; Zahra, D, Monk RL, Corder, E (2015) Alcohol and Alcoholism

Warning Labels

Cancer Warning

National Drinking Guidelines



Example Standard Drink Information

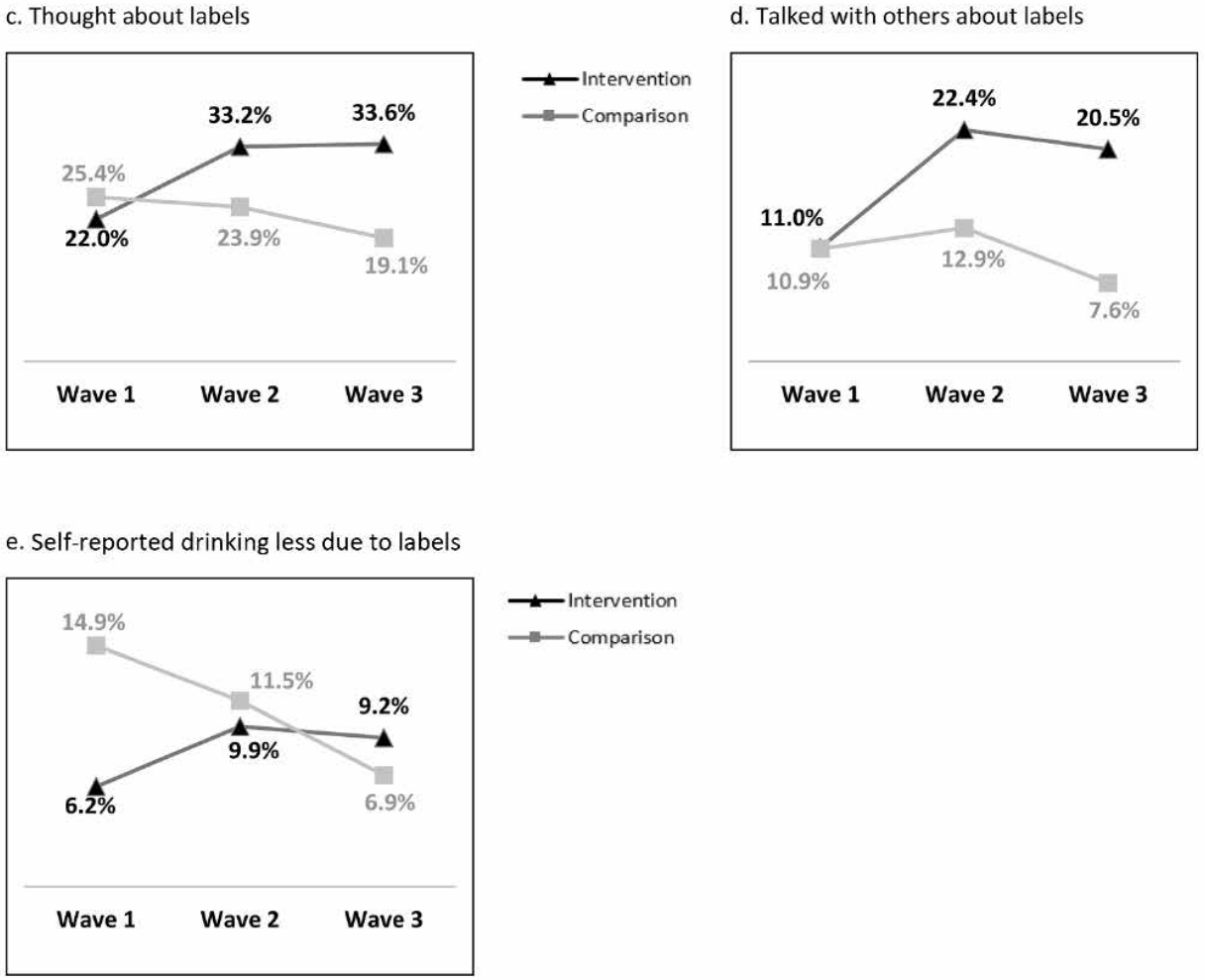
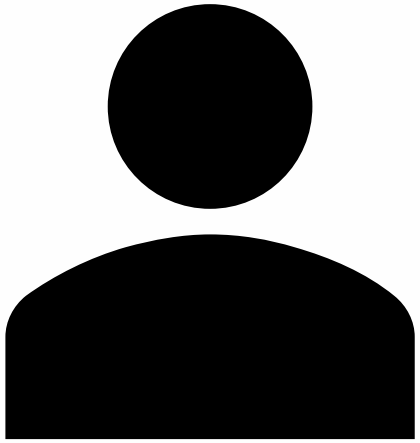


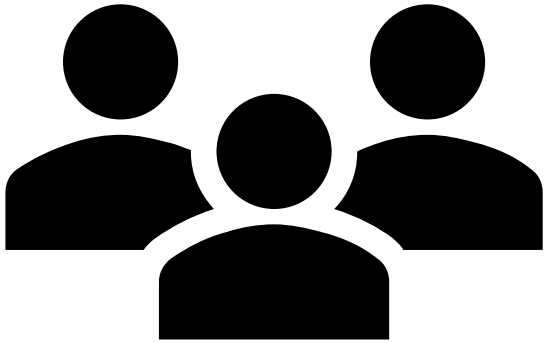
Fig. 3. (a–e). Impact of alcohol warning labels on label outcomes in intervention and comparison sites.

Hobin, E. et al. (2020) Canadian Journal of Public Health; Journal of Studies on Alcohol and Drugs; International Journal of Drug Policy

Message Source



VS.



Multiple Source condition:

- More **believable**, **convincing** & personally **relevant**
- More likely to report they <u>should</u> & <u>would</u>:
  - Reduce current alcohol consumption
  - Reduce intentions to consume 5+ drinks in a single sitting

Jongenelis et al. (2018) American Journal of Health Promotion

Interpersonal Communication

- Family communication:
  - Interpersonal influence can shape decisions and health behaviors
- Clinicians:
  - Raising awareness
  - Personalization
  - Clear & consistent messaging

Klein, WMP, Jacobsen, PB, & Helzlsouer, KJ (2019) JAMA; Kelley, HH et al. (1983) Close Relationships

Alcohol Industry Strategies

Parallel tobacco industry strategies:

1) **denying, omitting, disputing** – evidence that alcohol consumption increases cancer risk
2) **distorting** – mentioning cancer, but misrepresenting risk
3) **distracting** – focusing discussion away from independent effects of alcohol on common cancers (breast & colorectal)

Petticrew, Hessari, Knai & Weiderpass (2017) Drug and Alcohol Review

Contextual Challenges

Mixed Messages

COVID-19 Resources Heart Attack and Stroke Sym

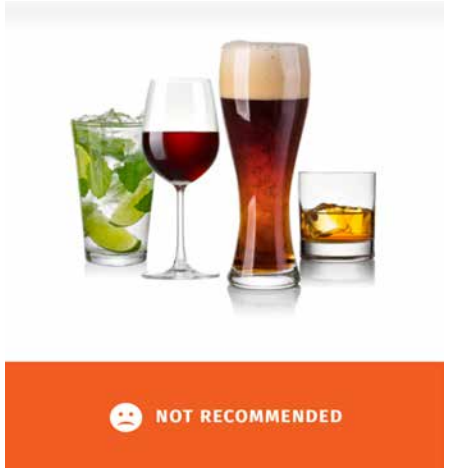
I drink every day, but not very much. Is that risky?

Some studies have shown that those who drink moderate amounts of alcohol have lower rates of heart disease than nondrinkers. But drinking alcohol every day to excess can lead to serious cardiovascular disease risks including high blood pressure, obesity and stroke. If you find yourself drinking more and more over time, consider cutting back.

https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/nutrition-basics/alcohol-and-heart-health

Sociocultural Aspects

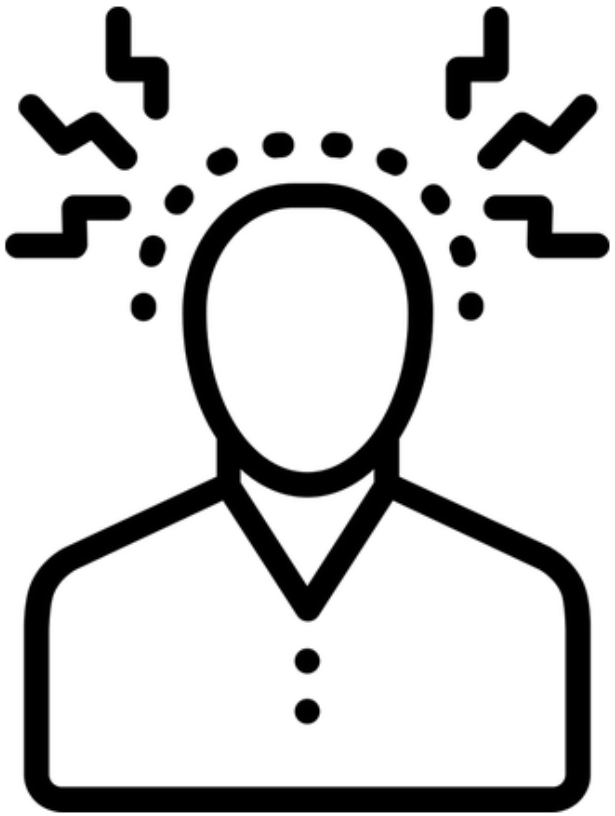
Guideline Conflicts/Changes



www.airc.org

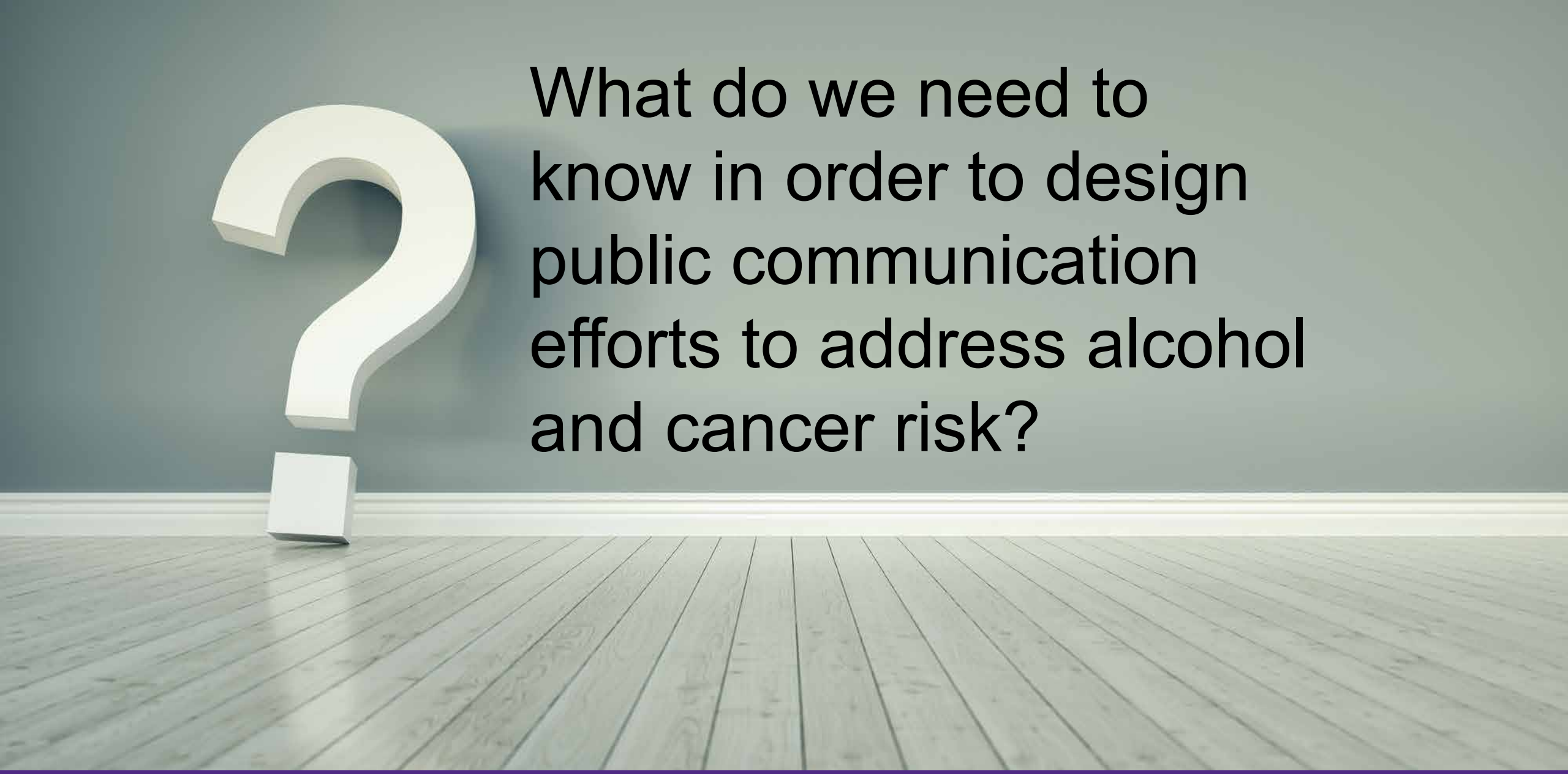
Klein, WMP, Jacobsen, PB, Helzlsouer, KJ (2020). JAMA; Scherr, CL, & Hay, J (2019). Outlook

Psychosocial Challenges



- Cognitive Dissonance
- Reactance
- Information Overload
- Cause Ambiguity
- Fatalistic Beliefs

Klein, WMP, Jacobsen, PB, Helzlsouer, KJ (2020). JAMA; Scherr, CL, & Hay, J (2019). Outlook



What do we need to know in order to design public communication efforts to address alcohol and cancer risk?

Communication Discussion Topics

1. What roles could public communication campaigns play to affect alcohol use?
2. How should we think about misinformation circulating about relationship of alcohol and cancer as a topic to investigate?
3. How can we mitigate health disparities through communication?
4. How can we best support health care professionals as they discuss alcohol and cancer with patients and their families?
5. How should we counsel cancer patients about the utility of alcohol reduction?

Closing Remarks

William P. Klein, PhD

Associate Director

Behavioral Research Program

Division of Cancer Control & Population Sciences

National Cancer Institute

NIH NATIONAL CANCER INSTITUTE

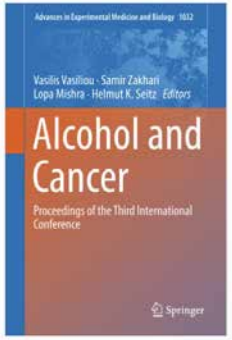
IF I HAVE SEEN FURTHER, IT IS BY STANDING ON THE SHOULDERS OF GIANTS

- SIR ISAAC NEWTON

50 YEARS
SAVING LIVES THROUGH CUTTING-EDGE RESEARCH
NATIONAL INSTITUTE ON ALCOHOL ABUSE AND ALCOHOLISM

NIH National Institute on Drug Abuse
Advancing Addiction Science

NIH National Heart, Lung, and Blood Institute



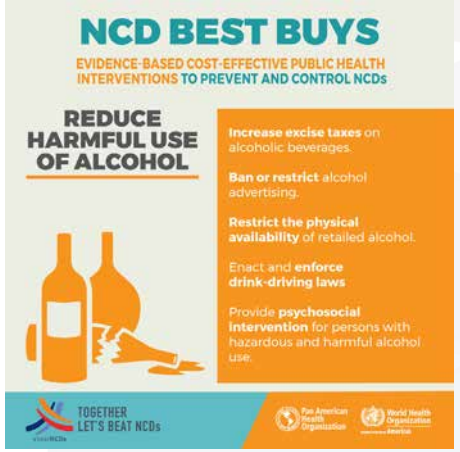
American Institute for Cancer Research

ASCO® AMERICAN SOCIETY OF CLINICAL ONCOLOGY

World Cancer Research Fund International

American Cancer Society®

WHO/PAHO



CDC

CANCER RESEARCH UK

.... and many more!

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Behavioral Research Program Selected Alcohol-Related Activities and Resources

- Panels and Sessions at Conferences: e.g. SBM, SPR, ASCO, APHA
- Consultation with SMEs: e.g. Dr. David Jernigan
- Webinars: e.g. Dr. Noelle LoConte, Alcohol and Cancer
- Data Resources: Health Information National Trends Survey
- Funding for Alcohol and Tobacco Supplements, 2020
- 2020 Notice of Special Interest (NOSI) on Alcohol and Cancer (w/NIAAA)
- Fellows Training and Research: J. Scheideler, K. Wiseman, R. Eck, A. Budenz, H. Platter, A. Siedenberg, M. Mayer etc.
- Workshop Dec. 8-10th, 2020: Alcohol and Cancer: Identifying Evidence Gaps and Research Challenges Across the Cancer Control Continuum

Alcohol as a Target for Cancer Prevention and Control: Research Challenges. Public Webinar, 2:00-3:30 pm EST Dec. 18th 2020

This Issue | Views 25,658 | Citations 5 | Altmetric 327 | Comments

Viewpoint

December 13, 2019

Alcohol and Cancer Risk

Clinical and Research Implications

William M. P. Klein, PhD[1]; Paul B. Jacobsen, PhD[2]; Kathy J. Helzlsouer, MD, MHS[3]

» Author Affiliations

JAMA. 2020;323(1):23-24. doi:10.1001/jama.2019.19133

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THANK YOU