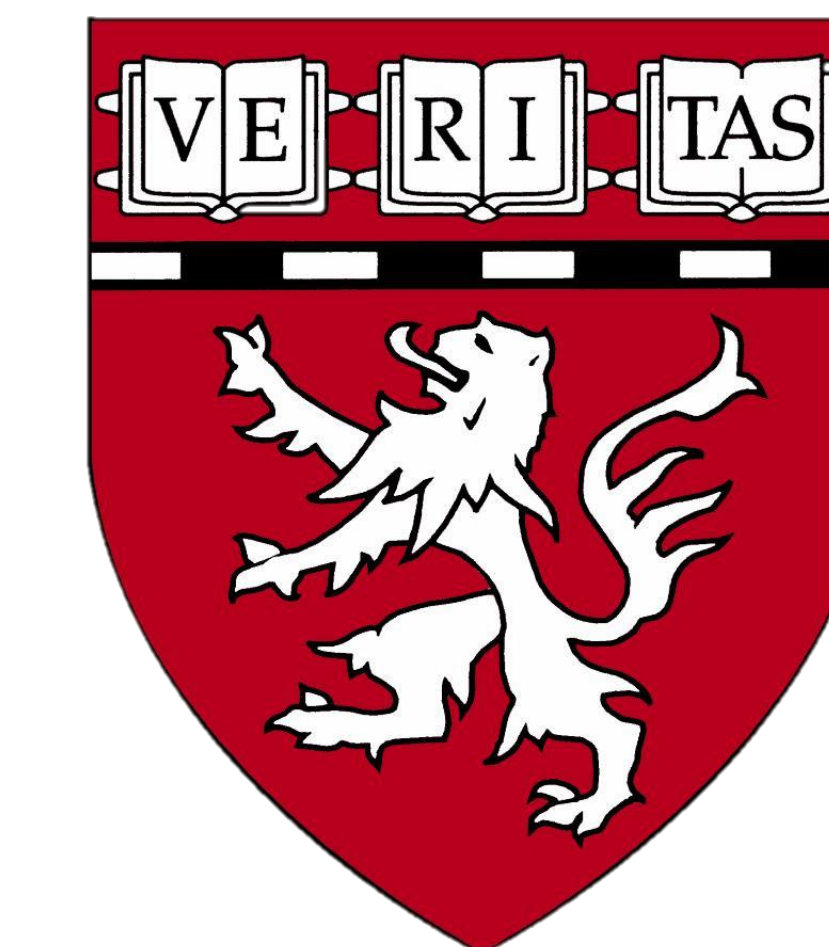


Substance Use, Cancer Incidence, and Mortality among Medicare Beneficiaries

Mina Bakhtiar MD^a, Tianfeng Zhang MPH^b, Jessica Phelan MS^c, Helen A. Shih MD MS MPH^d,

E. John Orav PhD^e, Miranda B. Lam MD MBA^f

^aHarvard Radiation Oncology Program, Boston, MA, ^bDepartment of Radiation Oncology, Brigham & Women's Hospital/Dana-Farber Cancer Institute, Boston, MA, ^cHarvard T.H. Chan School of Public Health, Boston, MA, ^dDepartment of Radiation Oncology, Massachusetts General Hospital, Harvard Medical School, Boston, MA, ^eHarvard T.H. Chan School of Public Health, Brigham & Women's Hospital, Harvard Medical School, Boston, MA, ^fDepartment of Radiation Oncology, Brigham & Women's Hospital/Dana-Farber Cancer Institute, Harvard Medical School, Boston, MA



BACKGROUND

- Rising rate of substance use and substance use disorder (SUD) among cancer patients and Medicare beneficiaries
- Medicare patients separately impacted by high cancer incidence and mortality
- Alcohol and tobacco are well-established carcinogens, and other controlled substances (Opioids, Cannabis, Sedatives/Hypnotics, Cocaine/Other stimulants, Inhalants, Hallucinogens, Other psychoactive substances) have been linked to cancer risk and cancer-related death in international studies
- The association between substance use and cancer incidence or mortality among Medicare beneficiaries has not yet been described

GOALS

- **Determine the risk of incident cancer among Medicare beneficiaries with a diagnosis of substance use/SUD**
- **Determine the risk of mortality among Medicare beneficiaries with cancer AND a diagnosis of substance use/SUD**

METHODS

- Retrospective cohort study, 20% random sample fee-for-service Medicare beneficiaries
- Multivariable models were adjusted for age group, race, sex, dual eligibility, medical comorbidities

Incident Cancer

- ICD-10 codes to identify patients with a substance use or SUD diagnosis in 2016
- Alcohol and Nicotine analyzed separately because independently linked to cancer risk
- Individuals with a pre-existing cancer diagnosis (2014-2016) were excluded from the study
- Reference cohort: individuals without a substance use or SUD diagnosis

Mortality

- ICD-10 codes to identify patients with a cancer diagnosis AND a substance use or SUD diagnosis in 2017-2020
- Reference cohort: individuals with a cancer diagnosis WITHOUT a substance use or SUD diagnosis in 2017-2020

RESULTS

Table 1: Substance Use Frequencies

Substance Use Category*	Frequency (%)
Alcohol**	41,854 (11.1%)
Opioids	59,061 (15.6%)
Cannabis	13,073 (3.5%)
Sedative & Hypnotic	7,627 (2.0%)
Cocaine	7,020 (1.9%)
Other stimulants	6,236 (1.7%)
Hallucinogens	367 (0.1%)
Nicotine**	296,885 (78%)
Inhalants	1,326 (0.4%)
Other psychoactive	26,117 (6.9%)

*Individuals could be included in more than one category
 **Analyzed separately from other controlled substances
 Total number of substance using individuals: 377,699
 Total number of individuals: 4,234,731

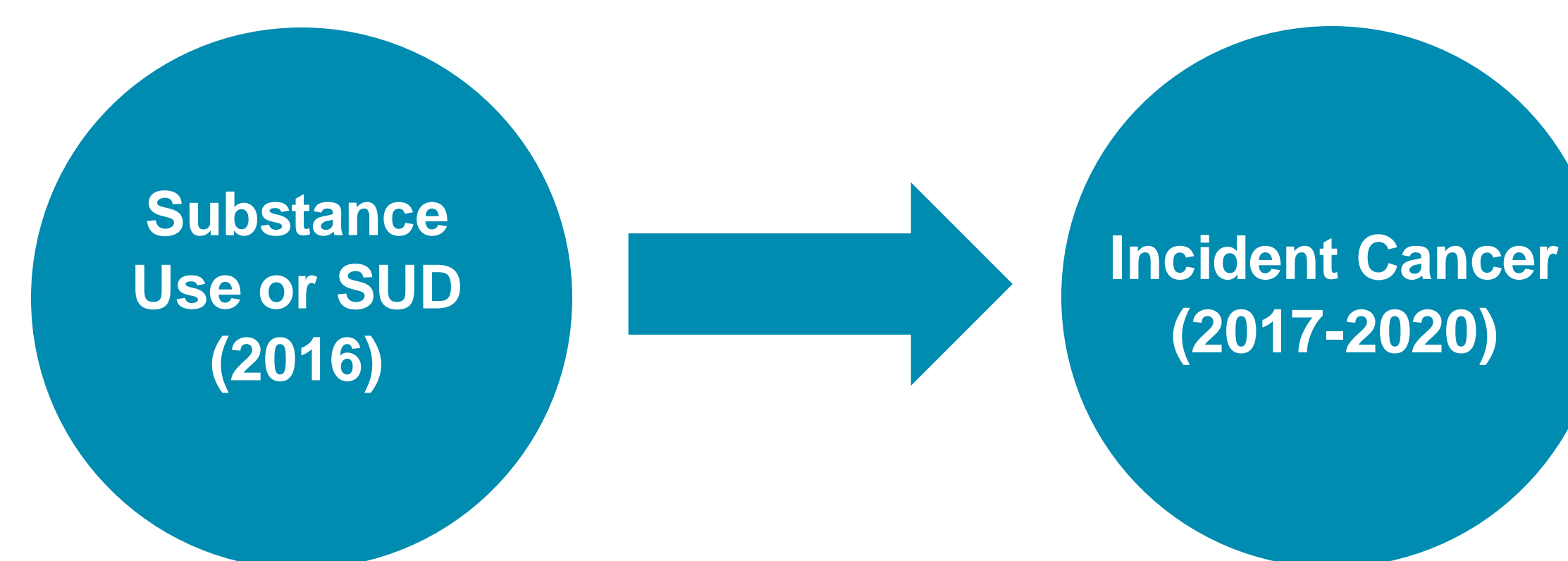


Table 2: Incident Cancer Risk

Substance Use or SUD in 2016			
	aHR*	p value	95% CI
Nicotine and/or Alcohol	1.405	<0.001	1.386, 1.425
Other Controlled Substances**	0.997	0.890	0.961, 1.035
Other Controlled Substances AND Nicotine or Alcohol	1.207	<0.001	1.153, 1.265
Analysis by Substance Type			
Opioids	1.049	0.011	1.011, 1.088
Cannabis	1.099	0.069	0.993, 1.216
Cocaine/Other Stimulants	0.977	0.712	0.864, 1.105

*aHR: adjusted hazard ratio
 **Opioids, Cannabis, Sedatives/Hypnotics, Cocaine/Other stimulants, Inhalants, Hallucinogens, Other psychoactive substances

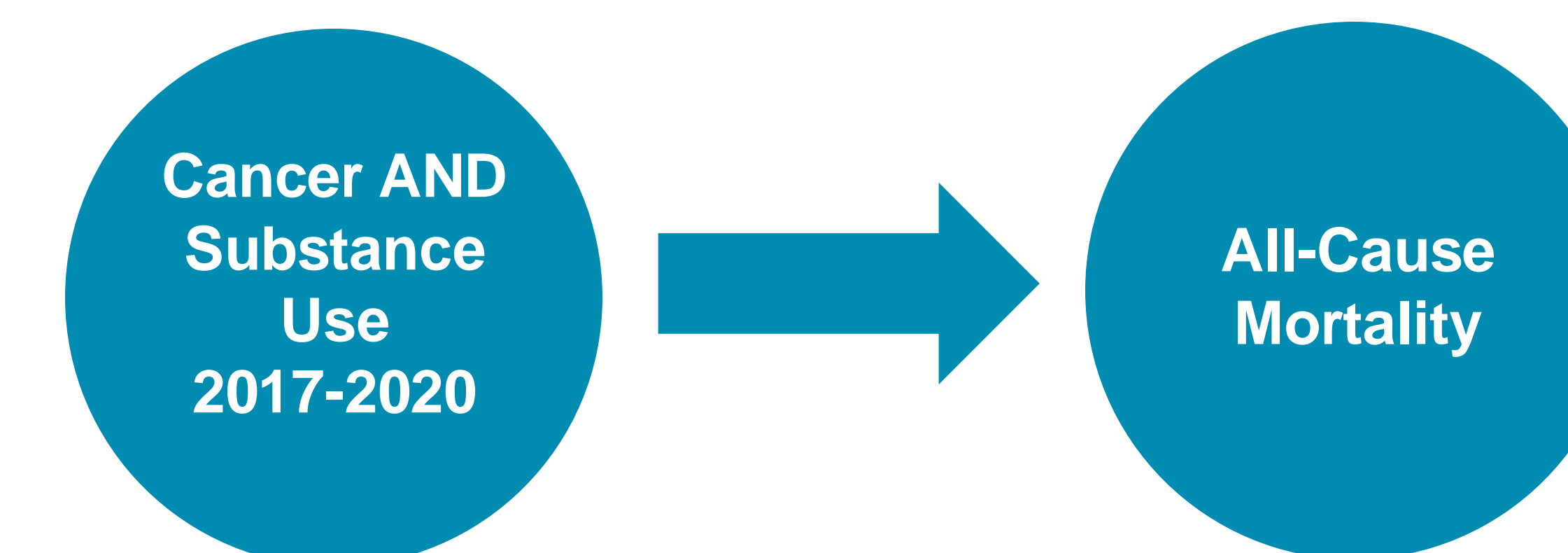


Table 3: All-Cause Mortality among Cancer Patients

Cancer & Substance Use 2017-2020			
	aHR	p value	95% CI
Nicotine and/or Alcohol	1.19	<0.001	1.164, 1.217
Other Controlled Substances	1.066	0.05	1.00, 1.137
Other Controlled Substances AND Nicotine or Alcohol	1.094	0.016	1.017, 1.178
Analysis by Substance Type			
Opioids	1.125	<0.001	1.06, 1.194
Cannabis	0.884	0.189	0.736, 1.063
Cocaine/Other Stimulants	0.837	0.106	0.674, 1.039

DISCUSSION & CONCLUSION

In this study, we separately analyze the impact of 1) alcohol or nicotine or 2) other controlled substances on cancer incidence and mortality among Medicare beneficiaries

- Expected increased risk of cancer diagnosis among those who use alcohol or nicotine
- Increased risk among those who use opioids or cannabis
- Increased risk of mortality among cancer patients who use alcohol, nicotine, or other controlled substances
- Further investigation into the association between opioid use and cancer risk and mortality is warranted

References



Funding: This work was supported by a grant from the National Cancer Institute (K08CA273549).
Contact: mina_bakhtiar@dfci.harvard.edu