



# **Prevalence and Correlates of EHR-Documented Medical Cannabis Use Among Primary Care Patients in WA State**

Theresa Matson, MPH

Kaiser Permanente Washington Health Research Institute

# Acknowledgments

## Co-authors:

David S. Carrell, PhD

David J. Cronkite, MS

Malia M. Oliver

Casey Luce

Udi E. Ghitza, PhD

Clarissa Hsu, PhD

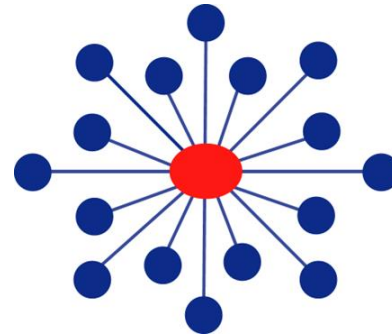
Katharine A. Bradley, PhD, MPH

Gwen T. Lapham, PhD, MPH, MSW

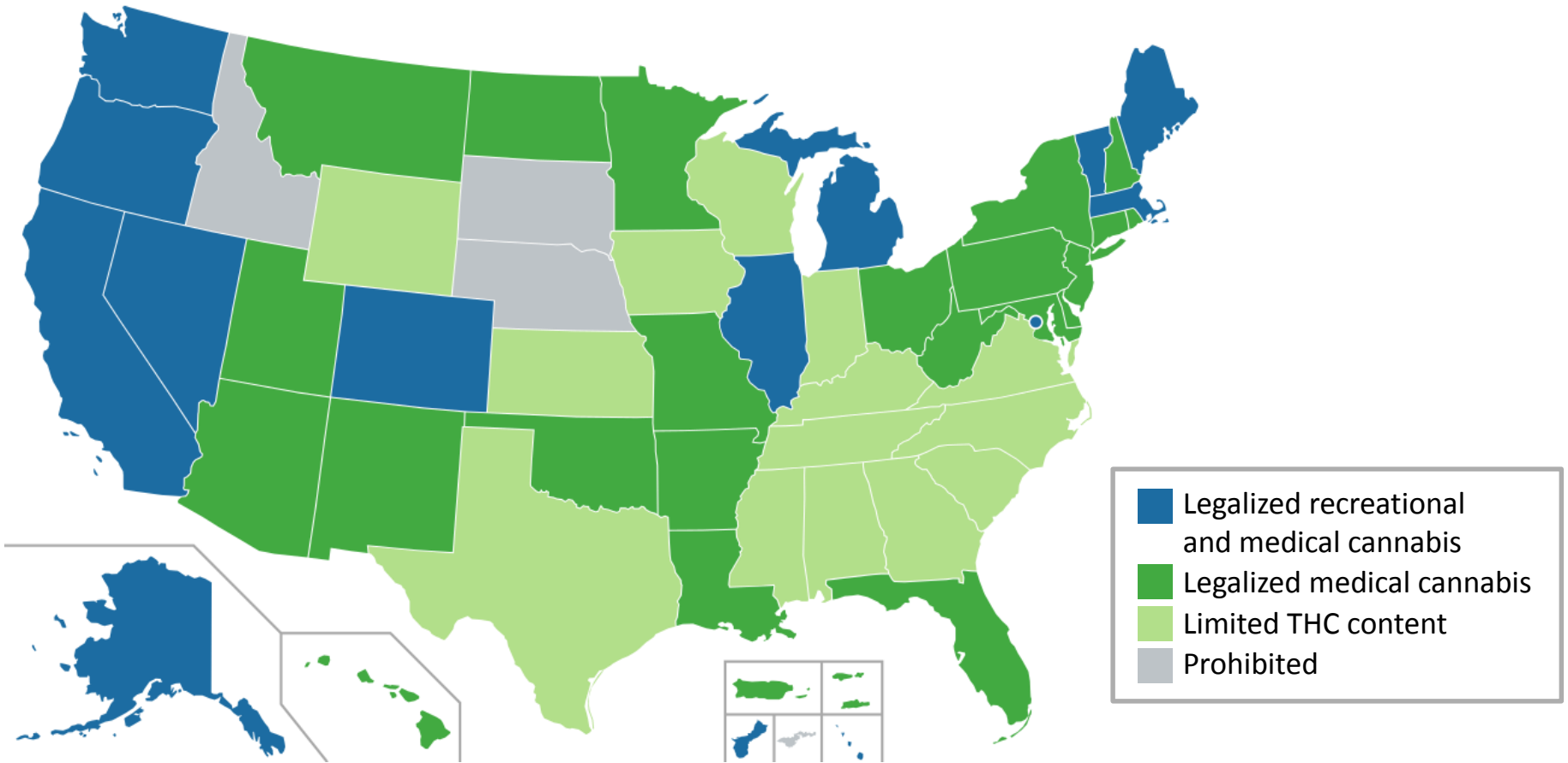
## Funding

National Drug Abuse Treatment Clinical Trials Network (CTN-0077)

National Institute on Drug Abuse (NIDA)



# Background



Hasin et al., *JAMA*, 2015  
National Conference of State Legislatures, 2018

# Background

- 12.9% prevalence of cannabis use (NSDUH 2013-2014)
- 9.8-46% prevalence of medical cannabis use among those reporting cannabis use
- Cannabis use associated with certain risks (cannabis use disorder), particularly for vulnerable populations
- Patients use cannabis to address a variety of concerns, many of which are supported by little to no evidence

National Academies of Sciences Engineering and Medicine, 2017  
World Health Organization, 2016

# Background

- Kaiser Permanente Washington routinely screens patients for frequency of cannabis use as part of behavioral health (BH) integration in primary care
- The brief BH screener does not currently capture information on medical cannabis or reasons patients may use cannabis

# Aims

- 1) Describe the prevalence of electronic health record (EHR)-documented medical cannabis use among patients in Washington State where medical and non-medical cannabis use are legal
- 2) Explore the prevalence of various health conditions by EHR-documented medical cannabis use
  - Conditions for which medical cannabis is authorized in WA state
  - Other conditions potentially associated with or attributed to cannabis
  - Medications that treat conditions for which people report using cannabis

# Methods

**Study design:** cross-sectional

**Data:** secondary EHR data

- 25 geographically-dispersed KPWA primary care clinics

## Eligibility criteria

- At least 18 years old
- Assessed for cannabis use as part of routine primary care  
11/2017 - 11/2018

# Measures

## Aim #1 Outcome

Composite measure of EHR-documented cannabis use in the past year

- No documented cannabis use
- EHR-documented cannabis use
- EHR-documented *medical* cannabis use



# Measures

## Behavioral health screen

Identifies frequency of **any** cannabis use from EHR-documented behavioral health screens administered to patients as part of routine care

In the past year...

6. How often in the past year have you used marijuana?

Never  
0

Less than  
monthly  
1

Monthly  
2

Weekly  
3

Daily or  
almost daily  
4

# Measures

## NLP-guided manual chart review

Natural language processing (NLP) identifies mentions of documented **medical** cannabis use in EHR notes

# Measures

## NLP-guided manual chart review

Natural language processing (NLP) identifies mentions of documented **medical** cannabis use in EHR notes

He recently began using CBD oil daily and feels it has improved some of his physical symptoms. He does not report using marijuana for recreation.

# Measures

## NLP-guided manual chart review

Natural language processing (NLP) identifies mentions of documented **medical** cannabis use in EHR notes

Cannabis mention

He recently began using **CBD** oil daily and feels it has improved some of his physical symptoms. He does not report using **marijuana** for recreation.

Cannabis mention

# Measures

## NLP-guided manual chart review

Natural language processing (NLP) identifies mentions of documented **medical** cannabis use in EHR notes

He recently began using **CBD** oil daily and feels it has improved some of his **physical symptoms**. He does not report using **marijuana** for recreation.

Cannabis mention

Medical

Cannabis mention

# Measures

## Terms indicating *medical* reasons for use

abdominal pain	digestion	keep(s) me/him/her from	multiple sclero*	relie(f/ve/ves/ving)
ache(s)	djd	drinking	muscle aches	relief
add	doctor	laceration(s)	muscle spasm(s)	renal failure
adhd	eating	lbp	narcotic withdraw(al)	rheumat*
agitation	emergenc(y/ies)	less thc	nausea	rx
aids	emotional	letter	neck pain	seizure
anger	epilepsy	limb pain	negative ruminat*	seizure(s)
anxi(ous/ety)	extremity pain	lorazepam	nerves	seizures
anxiety	fall asleep	los(s/ses)	neurolog*	self medicat(e/ing/ion/ed)
appetite	feel sick	loss and grief	neuropath(y/ic)	self treat
arthritis	feeling sick	loss of appetite	no thc	sleep(ing)
attention deficit	feels sick	low back	not becoming addicted	spas(m/ms/tic)
authoriz*	felt sick	low back pain	not having to	stomach upset
authorization	fibromy*	low thc	np pain	surgery
avoid becoming addicted	fracture	manag(e/ing) s(x/ymptoms)	oa	symptoms
avoid having to	function	mania	opiate withdraw(al)	tbi
back pain	gad	medical	opioid withdraw(al)	therapy
bipolar	glaucoma	medical card	pain	topical lotion
cachexia	gout	medically	pains	trauma
cancer	hcv	medication	panic attack(s)	traumatic brain injury
card	headache(s)	medications	panic(ing/s/ed)	treatment(s)
cbd	health	medicinal	pcp(s) recommendation	uc
certificate	help(s) with (*) pain	medicines	pelvic pain	ulcerative colitis
chest pain	hepatitis	meds	phasing out	v(s/ersus) tramadol
chronic pain	high cbd	mental health	physical symptom(s)	vomit*
colitis	hiv	mfs	physician	wasting
convulsion(s)	ibs	migraine(s)	pmp	with thc
crohn(s)	improvement	mood	post trau(ma/matic) stress	withdrawal
degenerate joint	indigestion	more cbd	prescribed	withdrawal from
depression	inflammat*	mpd	prescription	without thc
depressive disorder	injury	Mps	ptsd	
detox	insomnia	ms	reduce morphine	

# Measures

## NLP-guided manual chart review

Natural language processing (NLP) identifies mentions of documented **medical** cannabis use in EHR notes

Cannabis mention ←

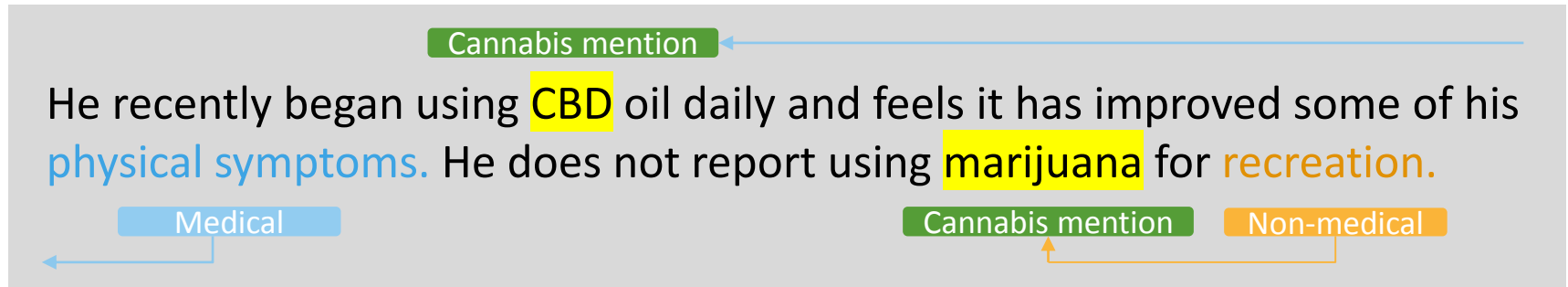
He recently began using **CBD** oil daily and feels it has improved some of his **physical symptoms**. He does not report using **marijuana** for recreation.

← Medical Cannabis mention

# Measures

## NLP-guided manual chart review

Natural language processing (NLP) identifies mentions of documented **medical** cannabis use in EHR notes





# Measures

## Terms indicating *ambiguous* reasons for use

calm(s/ed/ing) calm (*) down cop(e/es/ing) crutch edgy	edginess energy fee(lt/l)s (*) better fee(lt/l)s (*) good focus	get through good effect(s) help(s/ful/ing) illicit intoxicate(s/d)	keep (me/him/her) (*) numb (my/his/her) feelings overuse relax* self soothe(s)	(un)wind (down) stress temperament to calm working well
--	---	--	--	---

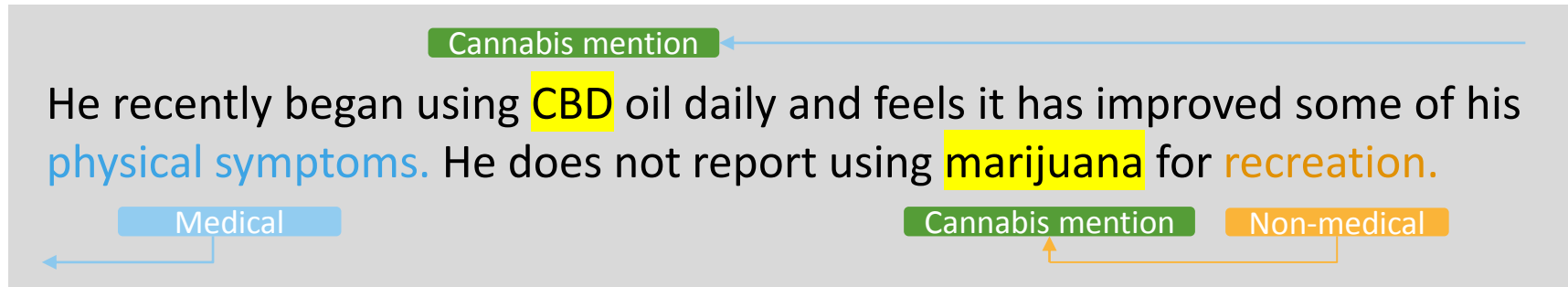
## Terms indicating *non-medical* reasons for use

bonding bored cut(s/ting) (back/down) edge off	enjoy enjoy(s/ing) entertain entertain(s/ment)	for work fun high like	like(d/s) off the edge recreation recreation	recreation(al/ally) thc with (*) friend(s)
---	---	---------------------------------	---	--

# Measures

## NLP-guided manual chart review

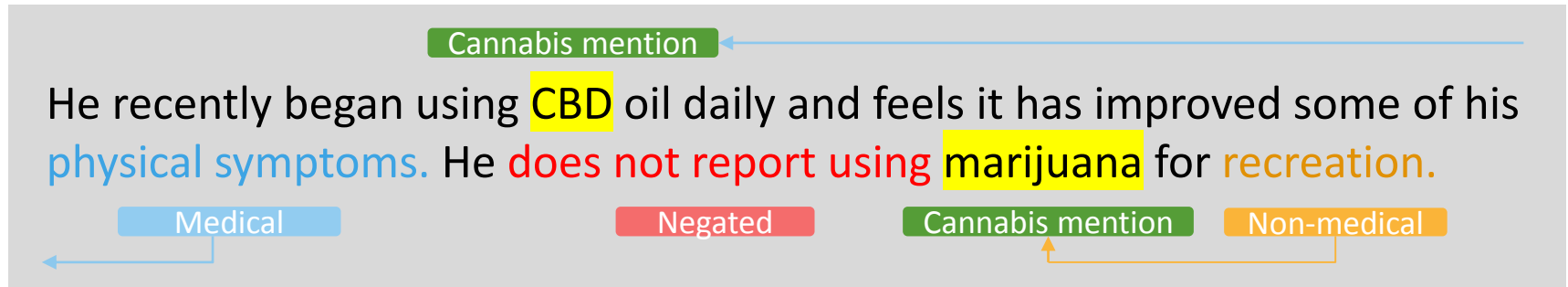
Natural language processing (NLP) identifies mentions of documented **medical** cannabis use in EHR notes



# Measures

## NLP-guided manual chart review

Natural language processing (NLP) identifies mentions of documented **medical** cannabis use in EHR notes



# Measures

## Aim #1 Outcome

Composite measure of EHR-documented cannabis use in the past year

- No documented cannabis use
- EHR-documented cannabis use
- EHR-documented *medical* cannabis use

### Behavioral health screen for frequency of cannabis use

Never      < Monthly      Monthly      Weekly      Daily

**NLP-identified  
medical  
cannabis use**

No

Yes

	Never	< Monthly	Monthly	Weekly	Daily
No					
Yes					

# Measures

## Aim #1 Outcome

Composite measure of EHR-documented cannabis use in the past year

- **No documented cannabis use**
- EHR-documented cannabis use
- EHR-documented *medical* cannabis use

### Behavioral health screen for frequency of cannabis use

Never      < Monthly      Monthly      Weekly      Daily

**NLP-identified  
medical  
cannabis use**

No

Yes

<b>No use</b>	

# Measures

## Aim #1 Outcome

Composite measure of EHR-documented cannabis use in the past year

- No documented cannabis use
- **EHR-documented cannabis use**
- EHR-documented *medical* cannabis use

### Behavioral health screen for frequency of cannabis use

Never      < Monthly      Monthly      Weekly      Daily

**NLP-identified  
medical  
cannabis use**

No

Yes

No use	<b>EHR-documented cannabis use</b>

# Measures

## Aim #1 Outcome

Composite measure of EHR-documented cannabis use in the past year

- No documented cannabis use
- EHR-documented cannabis use
- **EHR-documented *medical* cannabis use**

### Behavioral health screen for frequency of cannabis use

Never      < Monthly      Monthly      Weekly      Daily

**NLP-identified  
medical  
cannabis use**

No

Yes

No use	EHR-documented cannabis use
<b>EHR-documented <i>medical</i> cannabis use</b>	

# Measures

## Aim #2: Outcomes

### **Diagnoses for which medical cannabis is authorized in WA state:**

cancer, colitis, Crohn's disease, eating disorders, glaucoma, HCV, HIV/AIDS, epilepsy, seizures and other nerve disorders, any non-cancer pain and chronic pain, PTSD, chronic renal failure, sleep disorders, traumatic brain injury

### **Other diagnoses potentially associated or attributed to cannabis use:**

bronchitis and COPD, diabetes, heart and vascular diseases, mental health disorders (except PTSD), substance use disorders, tobacco use disorder

### **Medications that treat conditions for which people report using cannabis:**

antidepressants, antiemetics, medications for SUD, muscle relaxants, medications for nerve pain, opioids, other sedative hypnotics, benzodiazepines, and Z-drugs



# Measures

## Covariates

**Patient demographics:** gender, age, race, ethnicity

# Analyses

- Describe prevalence of no documented use, EHR-documented cannabis use and EHR-documented medical cannabis use
- Chi-square tests to describe unadjusted prevalence of demographic characteristics across measure of EHR-documented cannabis use
- Logistic regression models to estimate the adjusted prevalence of clinical characteristics for patients with no documented use, documented cannabis use and documented medical cannabis use.
  - Adjusted for demographic characteristics
  - Results presented as Percent (95% CI)

# Results

- 185,565 adult primary care patients screened for cannabis use

# Results

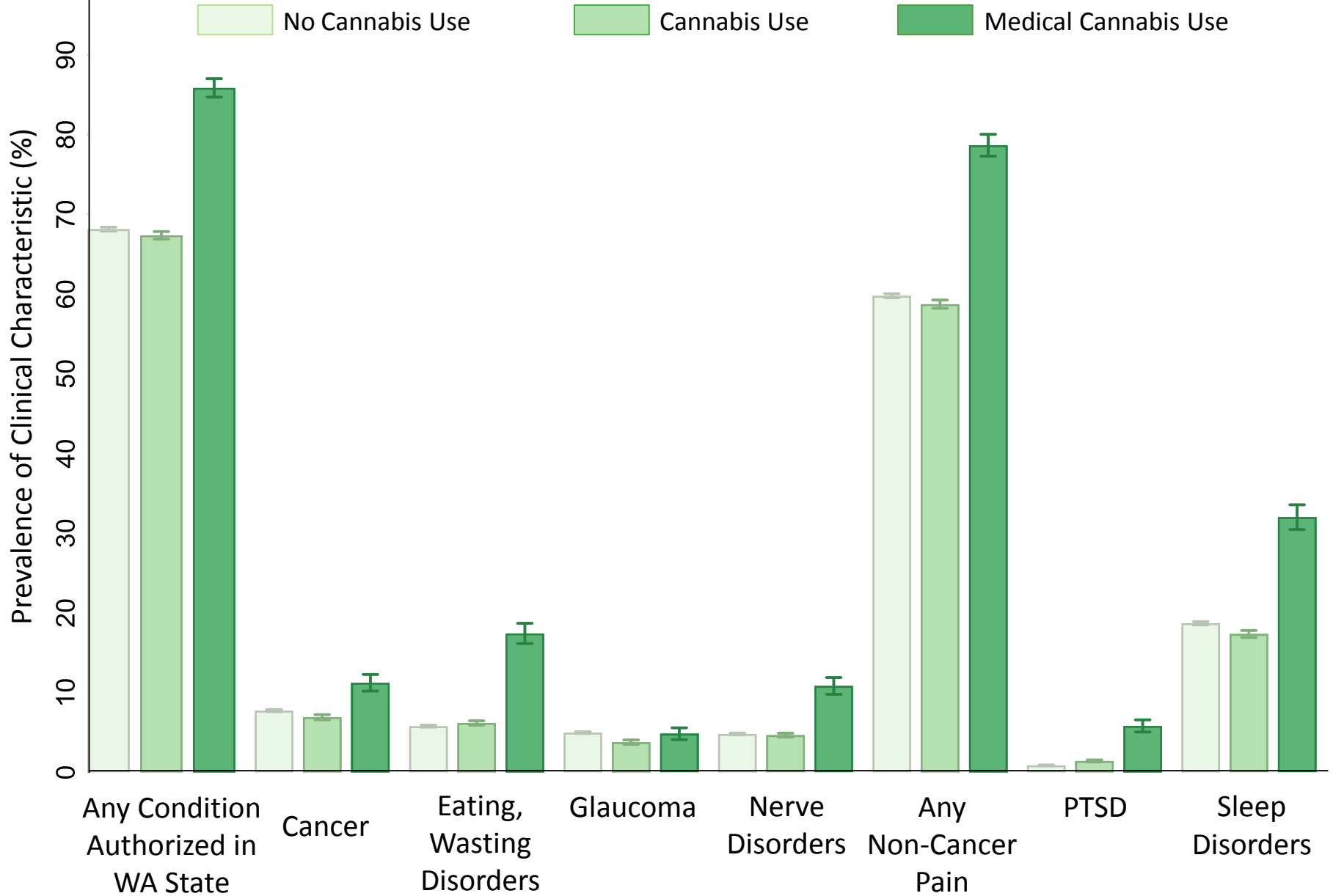
## Prevalence of EHR-Documented Medical Cannabis Use

- Among all patients:
  - No documented cannabis use: 78.4%
  - EHR-documented cannabis use: 19.8%
  - EHR-documented *medical* cannabis use: 1.9%
- Among patients with documented cannabis use:
  - EHR-documented cannabis use: 91.4%
  - EHR-documented *medical* cannabis use: 8.6%

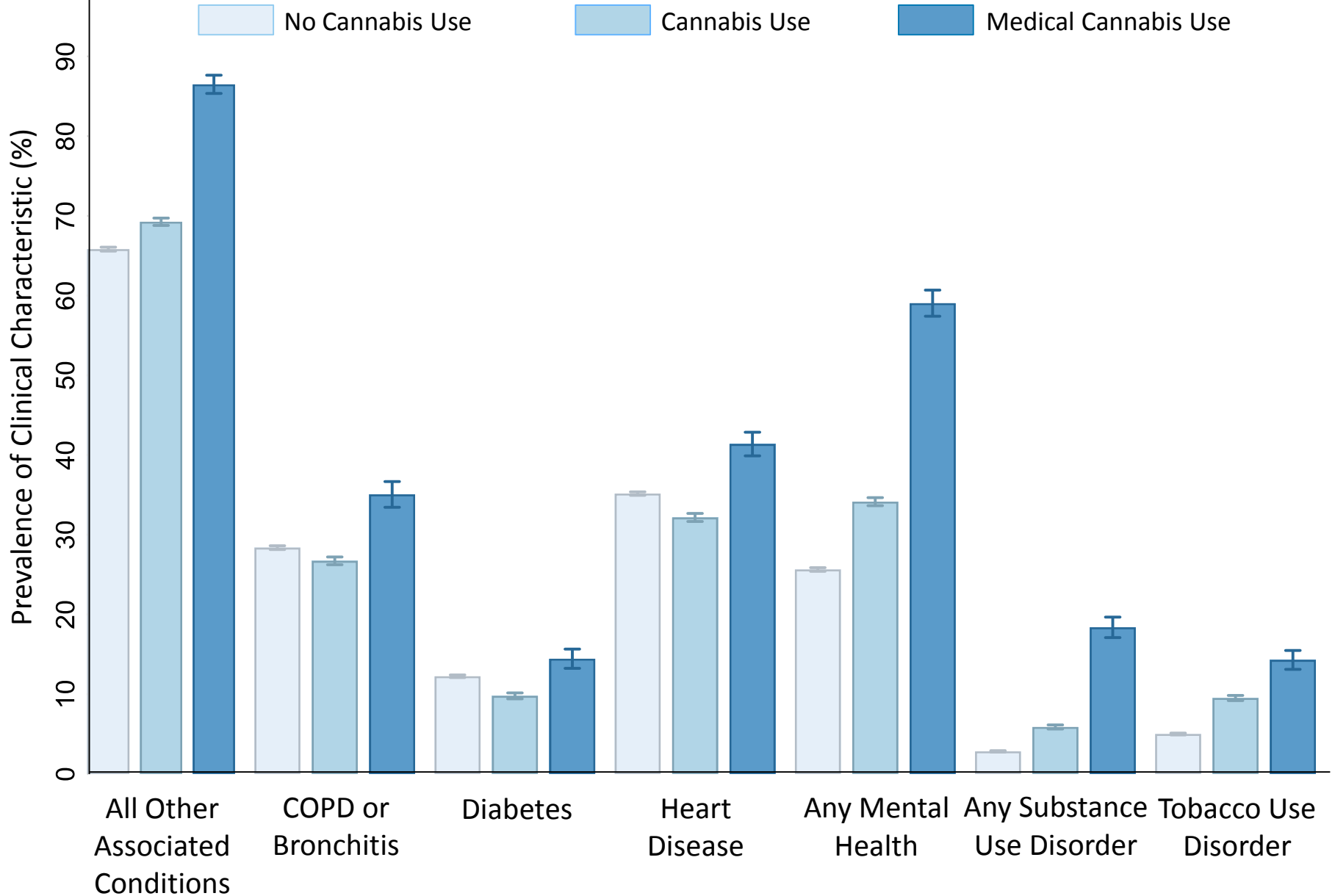
**Table 1.** Demographic characteristics of an adult primary care sample screened (11/2017-11/2018) for cannabis use by EHR-documented cannabis use

	<b>EHR-Documented Cannabis Use</b>		
	No Cannabis Use (N=145,431)	Cannabis Use (N =36,683)	Medical Cannabis Use (N=3,451)
	<b>%</b>	<b>%</b>	<b>%</b>
<b>Female</b>	61	51	59
<b>Age at Cannabis Screen</b>			
18-44	29	59	41
≥ 45	71	41	59
<b>Non-white Race</b>			
Asian	11	4	3
Black	5	5	4
Hawaiian/PI	1	1	1
Native American	1	1	1
Other	4	4	3
White	72	77	80
Multiracial	3	4	5
Unknown	4	5	4
<b>Hispanic Ethnicity</b>	<b>6</b>	<b>6</b>	<b>6</b>

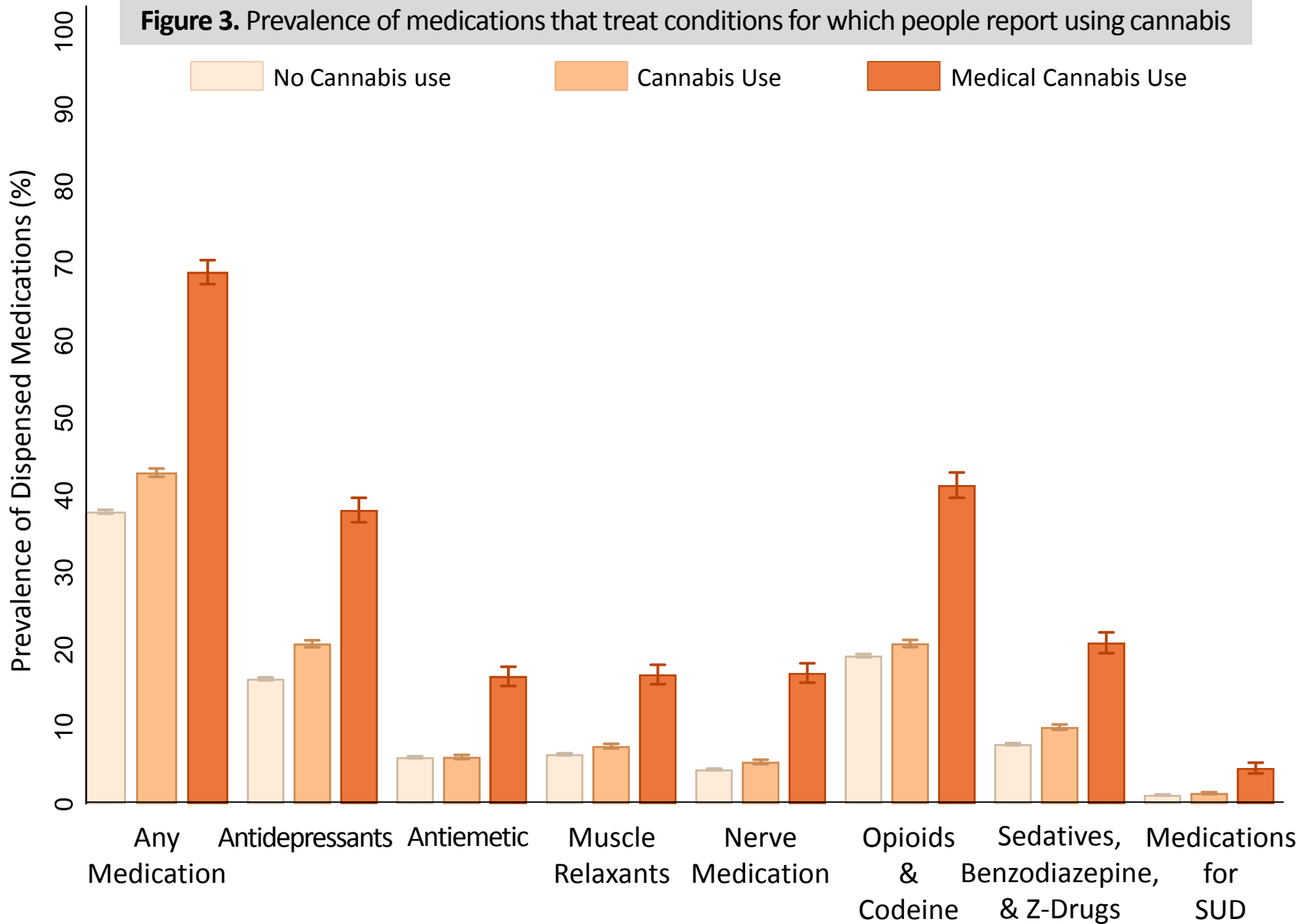
**Figure 1.** Prevalence of conditions for which medical cannabis is authorized in WA State



**Figure 2.** Prevalence of other conditions potentially associated with or attributed to cannabis use



**Figure 3.** Prevalence of medications that treat conditions for which people report using cannabis





## Limitations & Next Steps

- Our measure of EHR-documented medical cannabis use relies on patient self-report and provider documentation
- Some patients may have had more opportunity to disclose cannabis use
- Cannot determine causality
- Findings may not generalize to other populations

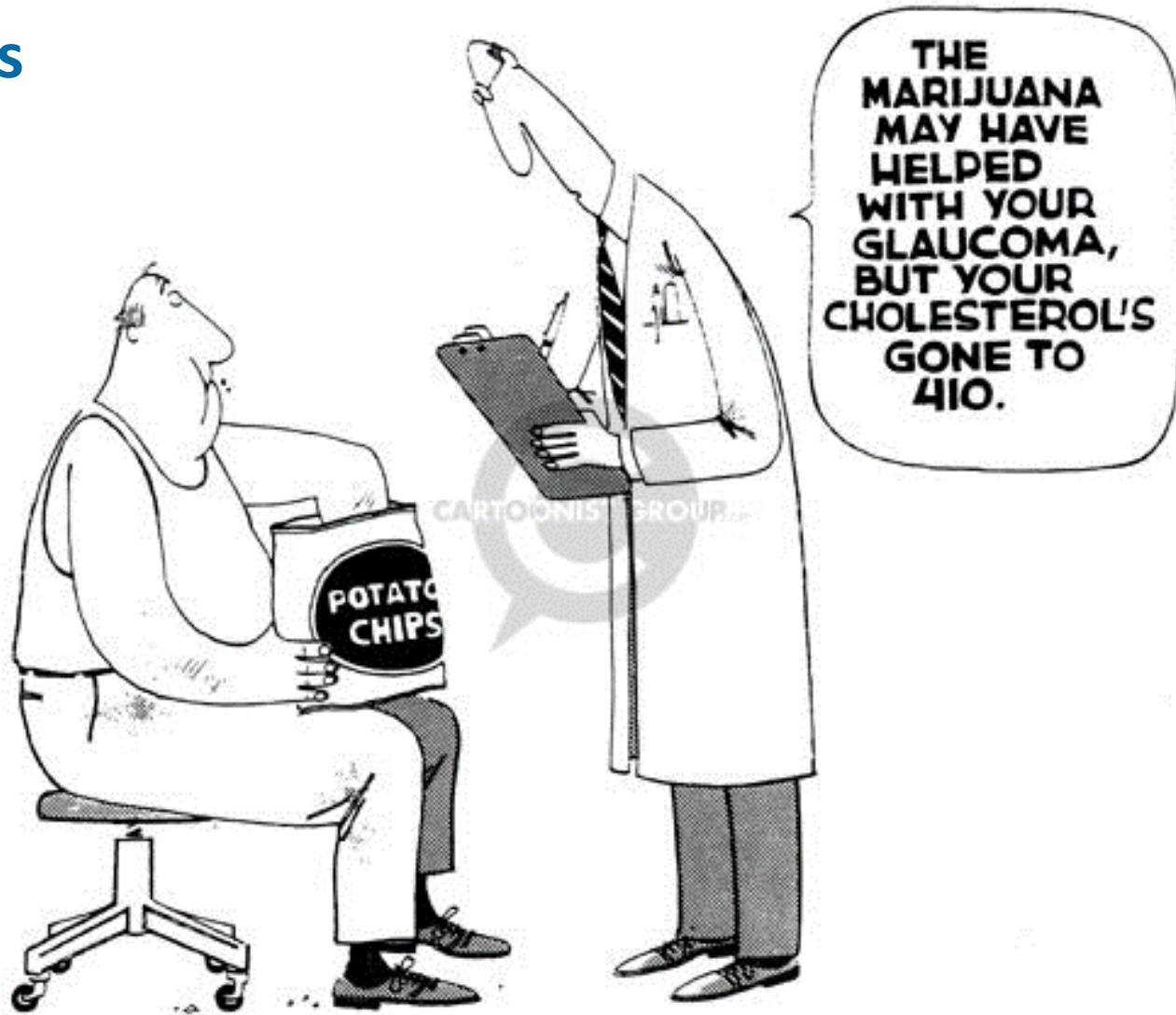
# Conclusion

- ~ 20% of KPWA adult primary care patients had EHR-documentation of cannabis use
- ~ 2% of patients had EHR-documentation of medical cannabis
- Patients with EHR-documented medical cannabis use are a unique subgroup.
  - They are more likely to have medical comorbidities, mental health and substance use disorders, and be dispensed medication for conditions

# Implications & Future Directions

- Health systems may be interested in identifying patients who use cannabis for medical reasons to better help them manage symptoms and avoid potentially adverse events
- We need better measures of how patients are using cannabis and for what reasons
- **Future Directions:**
  - Identify candidate screening questions that better reflect patients' reasons for using cannabis

# Questions



Copyright by Steve Kelley.