RAND Drug Policy Research Center

Marijuana Policies: What Matters for Influencing Public Health

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Marijuana debate is creating quite a bit of angst for state legislatures and the Feds

Overview of Today's Talk

1. **Primer on "marijuana policy", and how WA state laws are unique**

2. **Why prior studies evaluating impacts of earlier policies are inadequate for understanding today's policy environment**

3. **What are likely to be important elements of marijuana policies relevant for public health**

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State marijuana policy reforms have been taking place since the 1970s

- **State decriminalization began in the 1970s**
- **Medical marijuana policies began in the mid-1990s**
- **Marijuana legalization policies first passed in 2012**

There is a spectrum of marijuana policies

Definitions Matter!!

Let's start by defining each term: Prohibition

Prohibition

Mild or tough <u>criminal</u> sanctions for possession, use, growing, processing, sale and transportation

Let's start by defining each term: Decriminalization

Decriminalization

- **Removal of criminal sanctions for possession and/or use of small amounts of MJ**
- **(Usually) retain tough criminal sanctions on growing, processing, sale and transportation**

(sometimes confused with policies of non-enforcement)

But so-called "decriminalized" states are not all the same

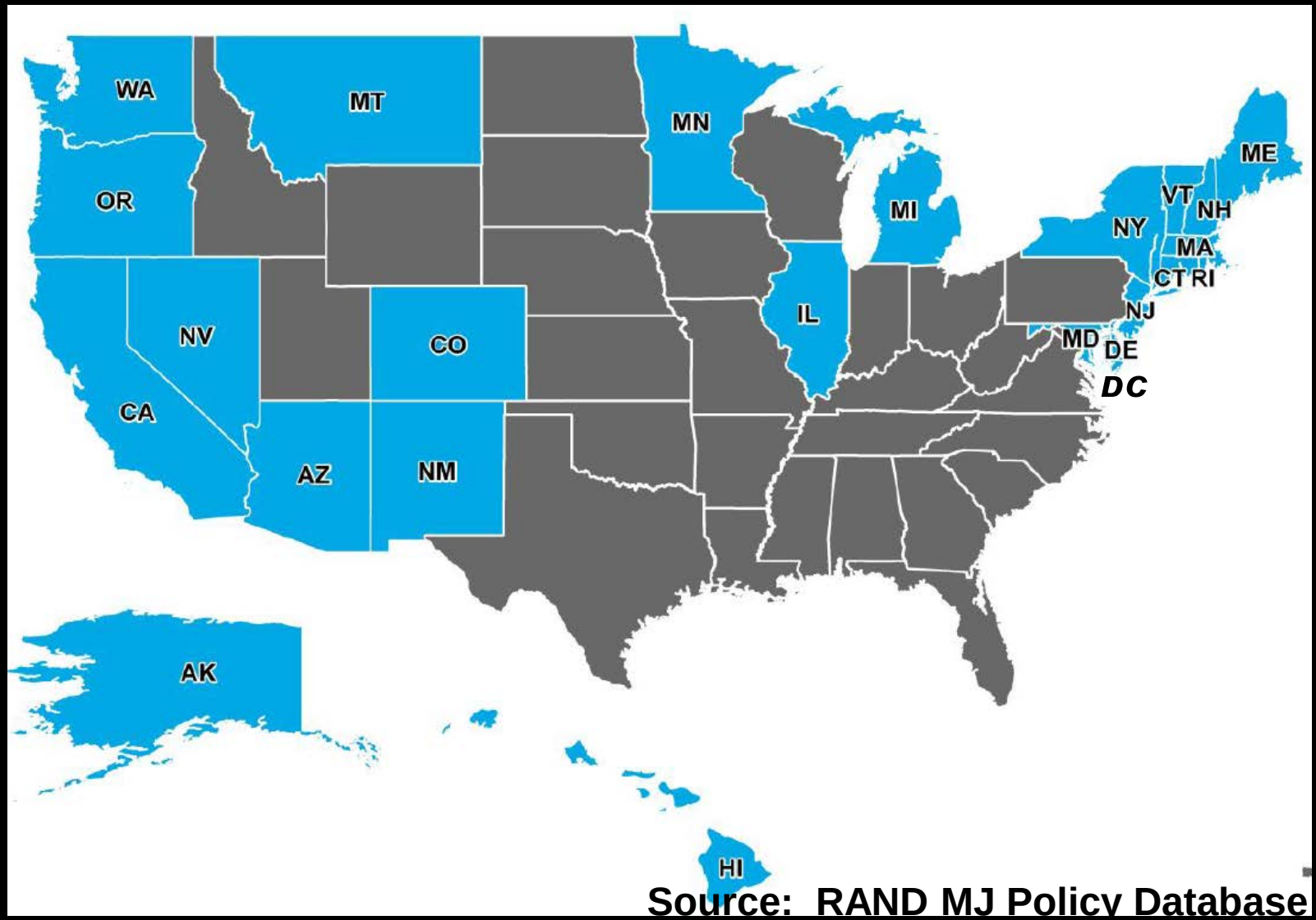
- **Many states (including Alaska, Colorado and California) retained the criminal status of possession offenses**
- **Many states only allowed reduced penalties for first time offenders**
- **And many states had strict limits on the amounts that were decriminalized versus criminalized**
- **By 1990, "decriminalized" states were not uniquely different from other states, yet "label" seemed to matter in some analyses**

(Pacula et al., 2003, 2005)

Let's start by defining each term: Medical Marijuana

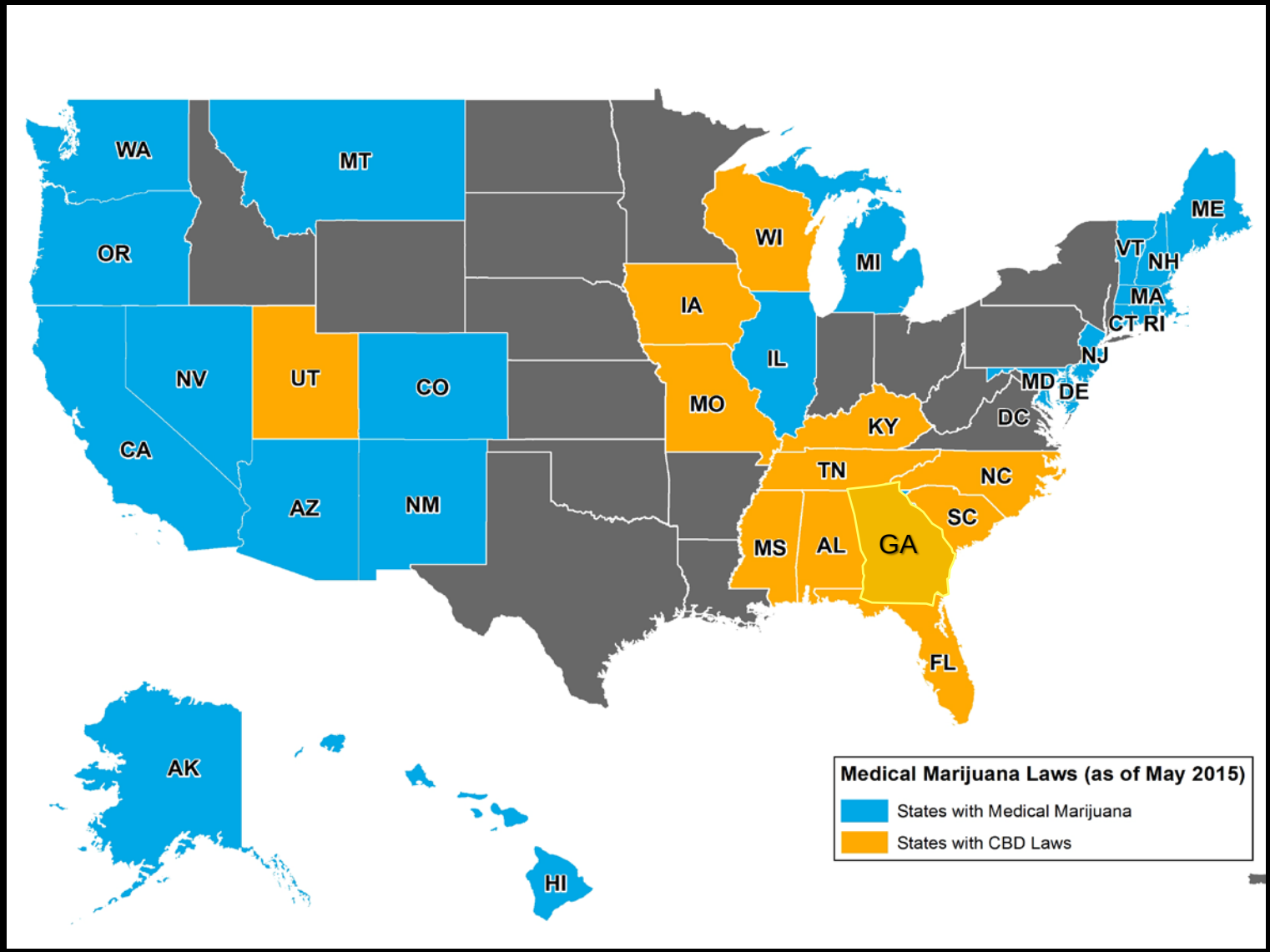
- **Removal of criminal sanctions for possession and/or use of (usually) small amounts for <u>medicinal purposes</u>**
- **Removal of criminal sanctions for growing / selling / providing specific amounts MJ for <u>medicinal purposes</u>**

There are 24 states plus DC that recognize "medical marijuana" as of December 2015



Source: RAND MJ Policy Database

Moreover, if you care about changing norms then CBD-only state policies may also be relevant

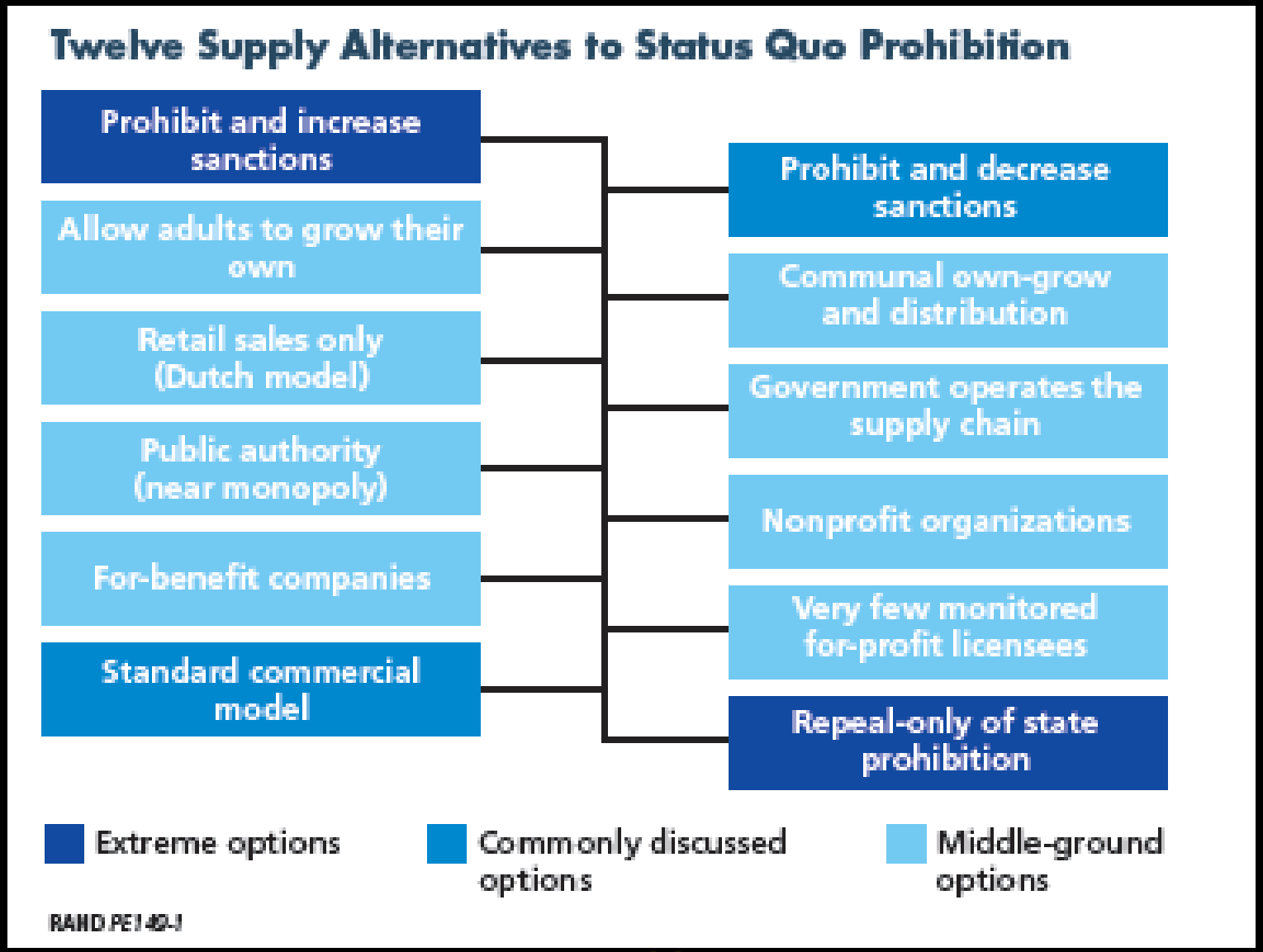


And finally we get to: Legalization

Legalization

- **Removal of criminal sanctions for :**
  - **Possession and/or use for adults**
  - **Growing**
  - **Processing**
  - **Distributing / transporting (within state)**
  - **Selling**
  - **Promotions/ Marketing (?)**

In a recent RAND Report, we discuss 10 different legal supply alternatives



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Source: Caulkins et al., 2015

However, there is more to legalization than just the supply chain

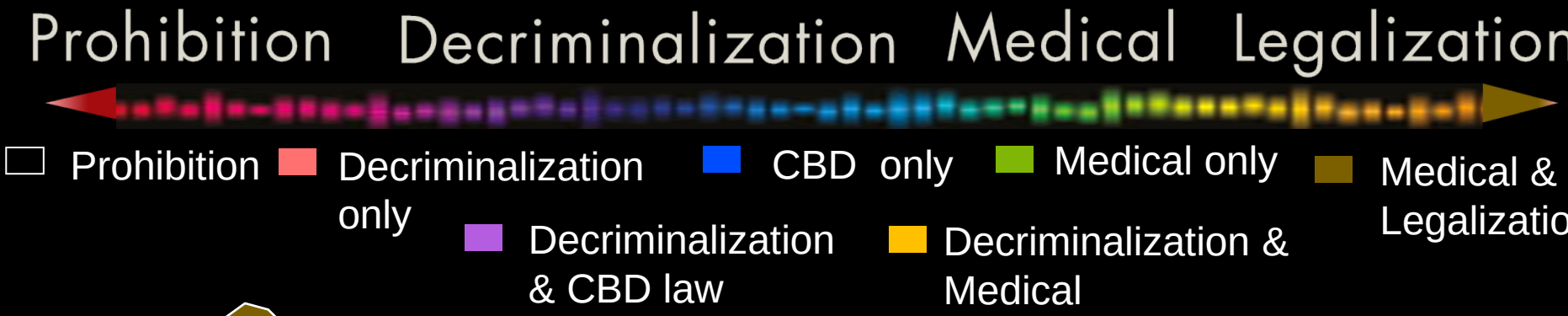
- **Regulation on products (types, additives, potency, product labelling, packaging)**
- **Regulation on seller/servers (age, training, types of outlets, outlet density/location, quantities, on-premise, pricing)**
- **Regulation on marketing (location, size, product placement, content)**
- **Regulation on use (who, what, where, how, how much)**
- **Taxation**

We know from alcohol/ tobacco research that these decisions influence public health harms and use too

WA's recreational marijuana system

- **Commercial market – with limits on the number of licenses (334 retail license limit) and high (37% excise) taxes at retail level.**
- **Retail stores can only sell MJ and its derivatives or paraphernalia – nothing else.**
- **Does not allow home cultivation (unlike CO, OR, DC and Alaska), personal use clubs (MJ lounges), or MJ deliveries.**
- **"Ground breaking" in terms of regulation of edibles**
- **Unusual in terms of retention of criminal charges for (a) possession of > 40 g (5 years, $10,000); (b) cultivation**

The U.S. is a patchwork of different MJ Policies



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Pacula 17 May 2016

Overview of Today's Talk

1. Primer on "marijuana policy", and how WA state laws are unique

2. **Why prior studies evaluating impacts of earlier policies are inadequate for understanding today's policy environment**

3. What are likely to be important elements of marijuana policies relevant for public health

There are at least four reasons why research to date is not definitive on the effects of MJ policy

(1) Much of the research ignores important policy heterogeneity

Majority of medical MJ studies treat laws as if they are homogenous policies

- **Medical MJ laws vary along several dimensions:**
  - **Patients (age, medical conditions/symptoms, registries)**
  - **Caregivers (age, relationship to patient, registries)**
  - **Quantities deemed allowable to possess / cultivate**
  - **Source (s) of supply and allowable supply chain**

- **Even states with dispensaries have different systems**
  - **Regulation authority (health, safety, revenue)**
  - **Rules regarding products sold and packaging / testing**
  - **Rules regarding number of outlets**
  - **Rules regarding for-profit status**

There are at least four reasons why research to date is not definitive on the effects of MJ policy

(1) Much of the research ignores important policy heterogeneity

(2) Current research also ignores how laws were implemented how they have changed over time

Medical marijuana laws have evolved and changed over time

States vary substantially in <u>core elements</u> that can influence access, perceived harm, and legal risk:

- **Patient/caregiver registration**
- **Home cultivation**
- **Dispensaries**

- **CBD-only laws did not start until 2014**

Enactment Year	Jurisdiction	Law	Dispensaries	Patient Registry	Home Cultivation
1996	CA	Prop. 215			x
1998	DC	Init. 59			
1998	OR	Measure No. 67			x
1998	WA	Init. 692			
1998	AK	Meas. 8			x
1999	ME	Quest. 2			x
2000	CO	Amend. 20			x
2000	NV	Quest. 9			
2000	HI	SB 862			x
2003	CA	SB 420	x		x
2003	MD	HB 702			
2004	MT	Init. 148			x
2004	VT	SB 76		x	x
2007	NM	SB 523	x	x	
2007	OR	SB 161		x	x
2007	RI	SB 791			x
2008	MI	Prop. 1			x
2009	ME	Quest. 5	x		x*
2009	RI	SB 185	x	x	x
2010	AZ	Prop. 203	x		x*
2010	CO	HB 10-1284	x	x	x
2010	DC	B 18-622	x	x	
2010	NJ	P.L. 2009	x		
2011	DE	SB 17-de	x		

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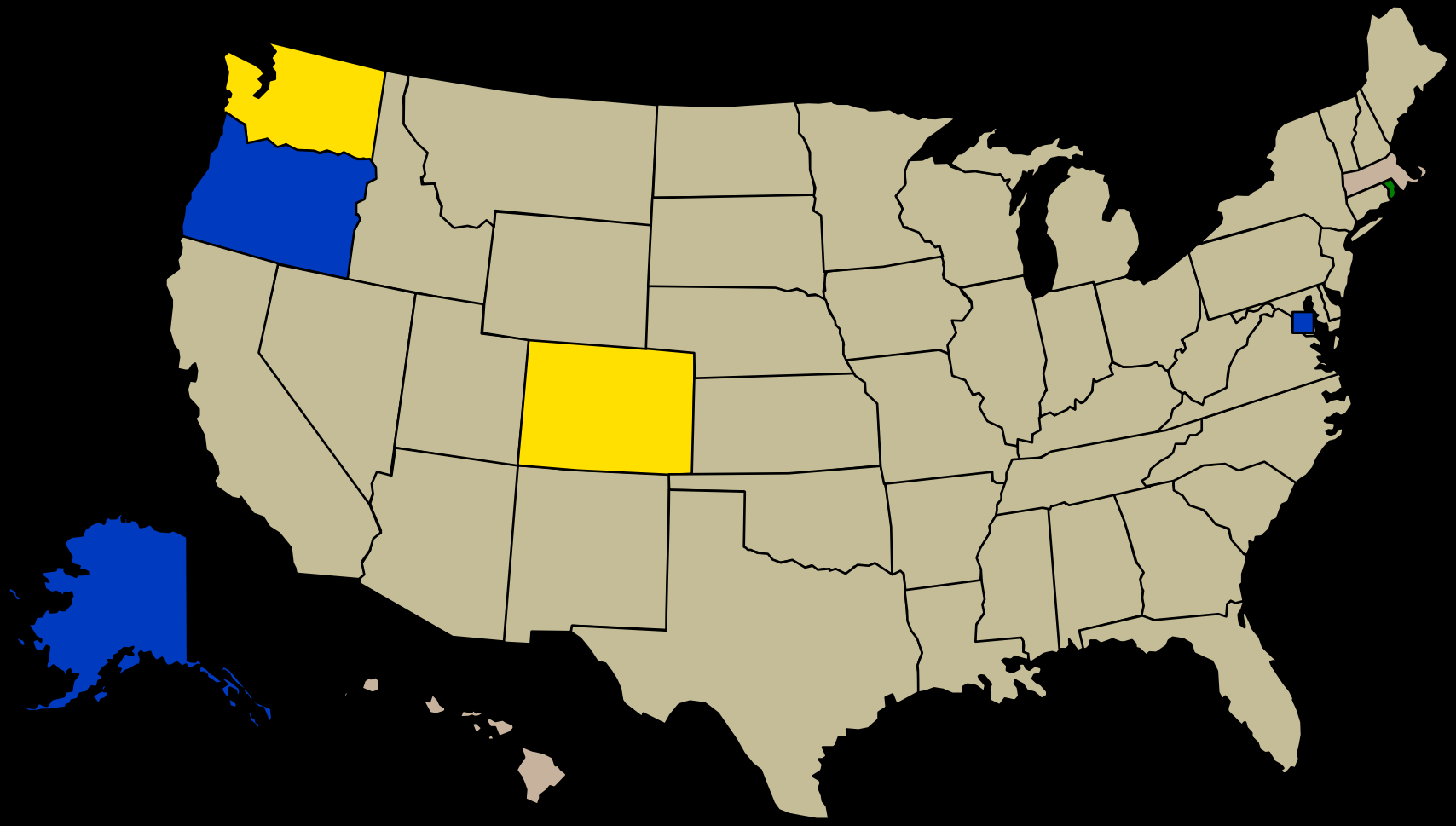
Source: Pacula, Boustead & Hunt (2014)

Legalization of Marijuana in the U.S as of December, 2015



Passed 2012, but stores didn't open until 2014

Passed 2014, but stores just opening in 2016

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Picuda 23 May 2016

Patient access has changed significantly over time due to state laws and the Federal Response

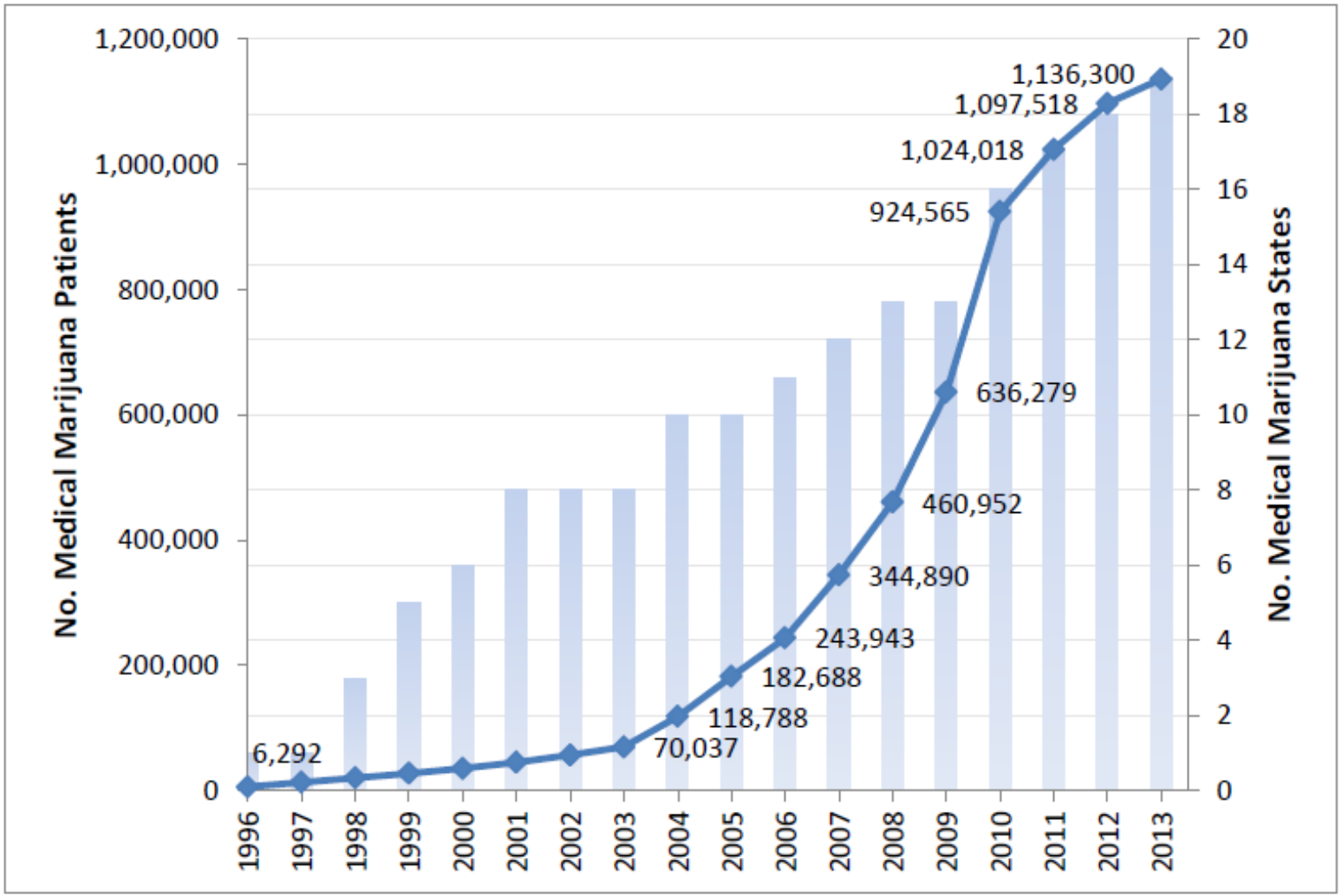

Figure 1. Number of Medical Marijuana Patients and States, 1996-2013

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Sevigny (2014) "Marijuana by the Numbers"

There are at least four reasons why research to date is not definitive on the effects of MJ policy

(1) Much of the research ignores important policy heterogeneity

(2) It also ignores how laws were implemented how they have changed over time

(3) The lack of attention to specificity and timing generates mixed and inconclusive findings

When we look at the effect of having any medical MJ law on use, findings are all over the place

Affect of law on Measure of Use	Any Medical MJ Law	Study Source*
Marijuana prevalence (Adults 21+)		
Thirty day prevalence (adult, NSDUH)	NS	Harper et al (2012)
Thirty day prevalence (adult, NSDUH)	+	Choi (2014)
Thirty day prevalence(Adult, NSDUH)	+	Wen et al (2015)
Thirty day prevalence (Adult, NLSY)	-	Pacula et al (2015)
Marijuana frequency or near daily use (Adults 21+)		
Thirty day frequency of use (NSDUH)	NS	Choi (2014)
Thirty day near daily use (Adult, NSDUH)	+	Wen et al (2015)
Marijuana Treatment Admissions (Adults 21+)		
MJ annual treatment admissions (Adult)	-	Pacula et al (2015)
	+	Chu (2014)

When we more precisely consider Medical MJ dispensaries, results are more consistent

Affect of law on Measure of Use	Legal Dispensary/ Loosely regulated	Study Source*
Marijuana Related Outcomes (Adults 21+)		
Thirty day prevalence & frequency of use (NSDUH)	NS	Choi (2014)
Thirty day prevalence & near daily use (Adult, NSDUH)	NS	Wen et al (2015)
Thirty day prevalence (Adult, NLSY)	+	Pacula et al (2015)
Thirty day prevalence (Adult, NSDUH)	+	Smart (2015)**
MJ annual treatment admissions (Adult)	+	Pacula et al (2015)

Smart study actually differentiated loose from strict regulation of dispensaries, and finds it is loose regulation that is associated with use

Impact of dispensaries may be changing, however, given growing restrictions on density

State	Law	Year of Law	Cap on Number	Year Opened
CA	SB420	2003		1996
ME	Question 5/ LD1296	2009 / 2011	4	2011
NM	SB 523	2009	Restricted by # patients	2009
RI	SB 185	2009	3	2013
AZ	Prop 203	2010	1 fo every 10 pharmacies	2012
CO	HB10-1284	2010		2005
DC	B18-622	2010	5	2013
NJ	PL 2009	2010	6	2012
DE	SB17	2011	8	
VT	SB17	2011	4	2013
CT	HB 5387	2012	Restricted by # patients	2014
MA	Question 3	2012	35 in first year	
NH	HB 573	2013	4	
MD	SB 923	2014	No more than 2 per legislative district in first year	

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Source: RAND MJ Policy Database

There are at least four reasons why research to date is not definitive on the effects of MJ policy

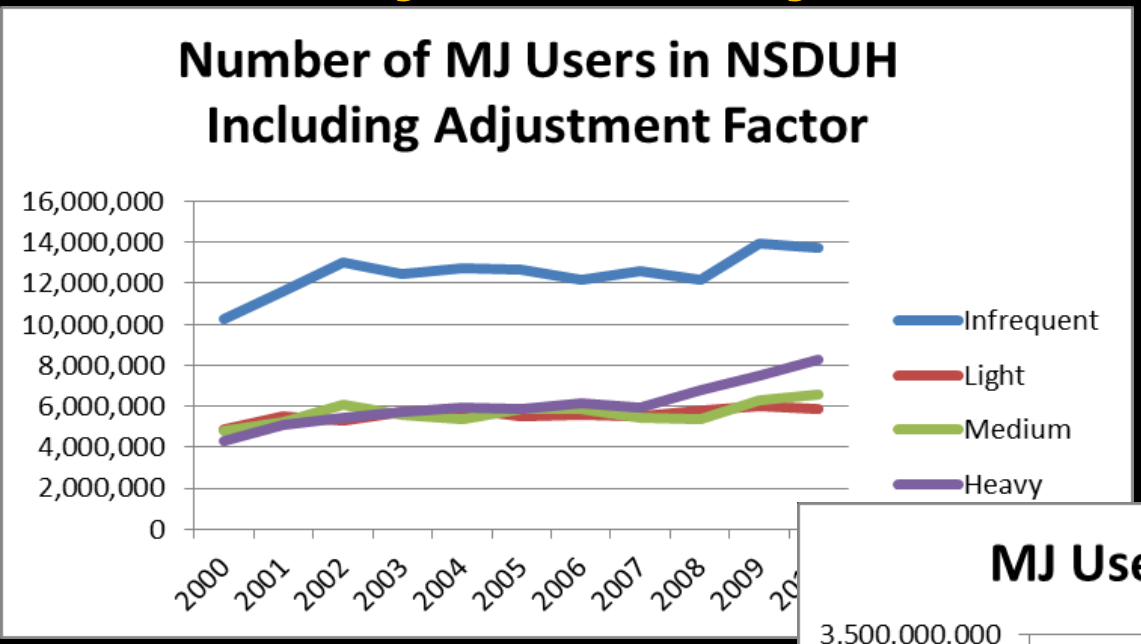
(1) Much of the research ignores important policy heterogeneity

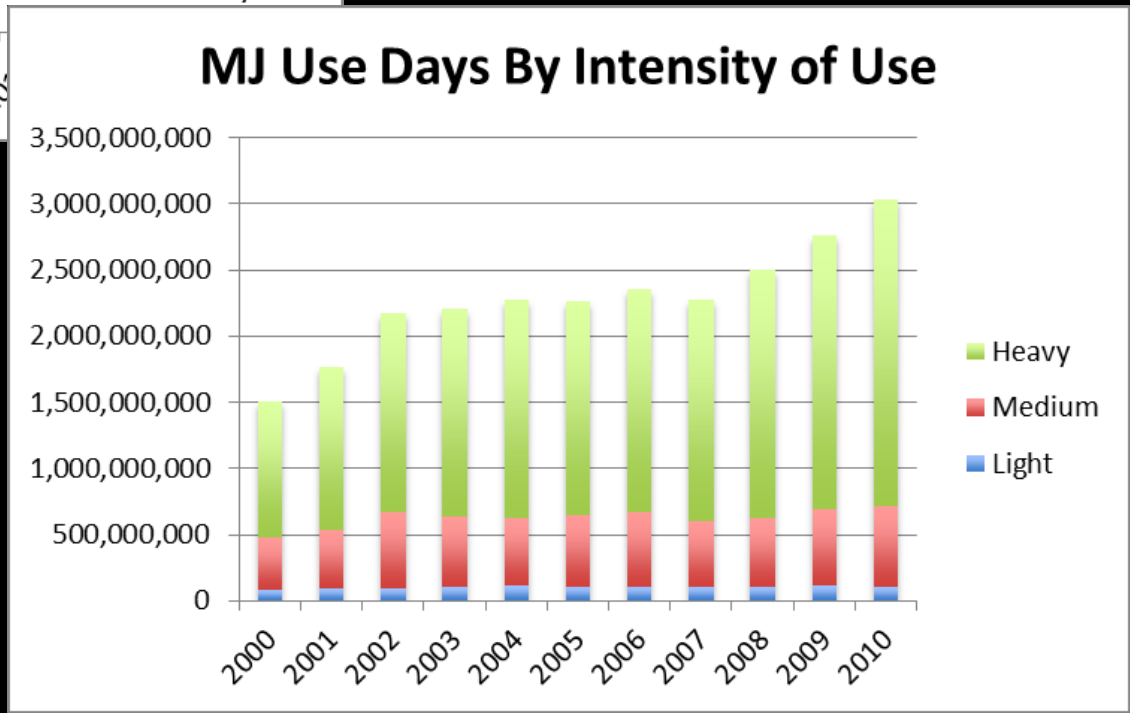
(2) It also ignores how laws were implemented how they have changed over time

(3) The lack of attention to specificity and timing generates mixed and inconclusive findings

(4) Much of the research focuses on margins of use that are not relevant for understanding harm (e.g. prevalence of use)

While the # of users has been steady until 2008, use days of heavy users has been growing





Source: Kilmer et al (2014) "What American users Spend on Illicit Drugs 2000-2010" for ONDCP

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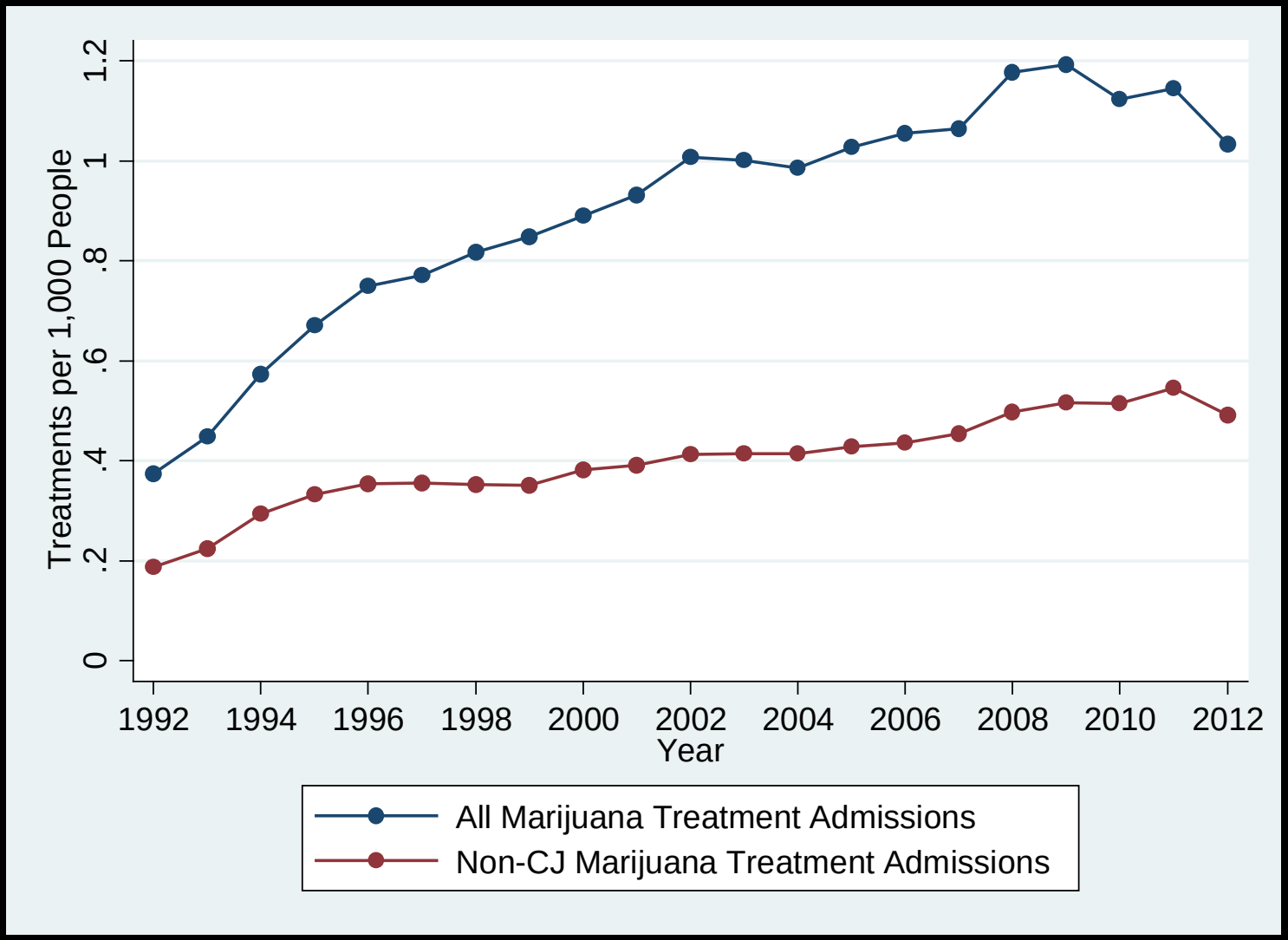
Referrals to treatment for marijuana as primary substance have also been growing



Alternative measures of use that are more relevant for measuring public health harms

- **Near daily use (youth, adults), age of first use**
- **Amount consumed / intoxication per use episode**
- **Simultaneous use with other substances (tobacco, alcohol)**
- **Use of particularly dangerous products or methods of consuming (eg. edibles, vaping, or dabbing)**
  - **Edibles associated with higher rates of pediatric accidental ingestion (Wang et al., 2013)**
  - **Vaping hash oil/dabbing is more positively associated with symptoms of dependence (Loflin & Earleywine, 2014)**

Summary of overall study findings

1. **Studies evaluating medical MJ laws need to be careful**
   - **Not all policies are the same; composite indicator hides important heterogeneity**
   - **Policies legally protecting dispensaries, and enable commercialization, generally undo any protective effect medical policy might have (norms do not seem to be the major driver here)**

2. **Study findings are sensitive to the specific policies that are being considered (time period, policy dimensions turned "on")**

3. **Study findings are sensitive to the specific population and measure being considered**

Overview of Today's Talk

1. Primer on "marijuana policy", and how WA state laws are unique (even "ground breaking")
2. Why prior studies evaluating impacts of earlier policies are inadequate for understanding today's policy environment
3. **What are likely to be important elements of marijuana policies relevant for public health**

What are the public health goals of marijuana liberalization policies?

- **Arguments most often referenced in debate:**

1. **Prevent youth access and use**
2. **Prevent drugged driving**
3. **Reduce potential for addiction and dependence**
4. **Regulate product content and form (potency)**
5. **Minimize concurrent use with alcohol , tobacco and other substances**

Others objectives clearly exist as well

Alcohol and tobacco literature suggest the following tools may be the most effective

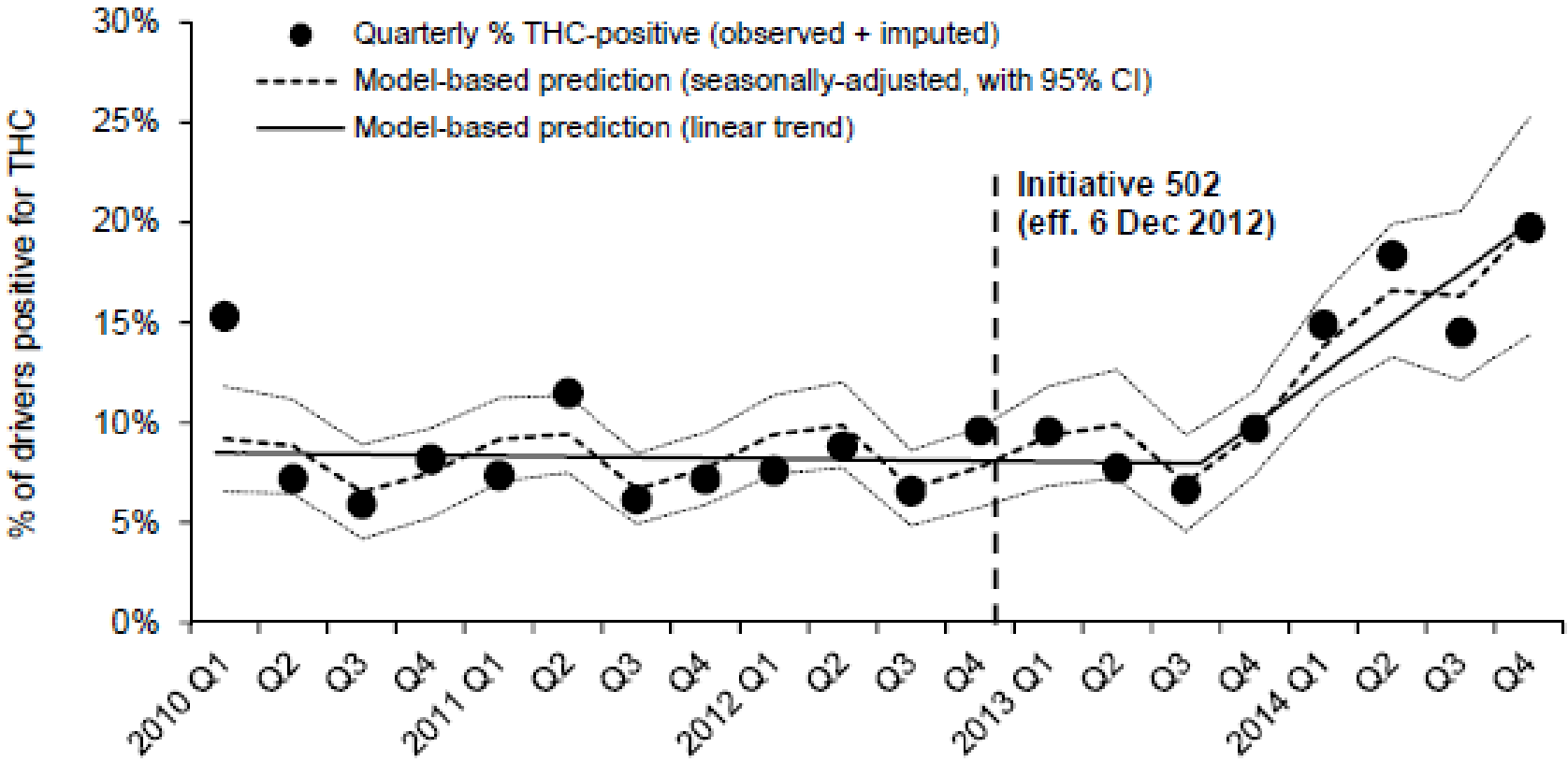
TABLE 1—Linking Regulatory Approaches to Public Health Objectives

Regulatory Choices	Public Health Objective to Minimize				
	Youths' Access and Use	Drugged Driving	Dependence and Addiction	Unwanted Contaminants and Uncertain Potency	Concurrent Use of Marijuana and Alcohol[a]
Increase prices	X	X	X		?
Create state monopoly	X	X	X	X	X
Restrict and monitor licenses and licensees	X	X	X	X	X
Limit products sold	X	X	X	X	
Limit marketing	X	X	X		X
Restrict public consumption	X	X	X		X
Measure and prevent impaired driving		X			X

[a]It is impossible to predict how concurrent use will influence social welfare under legalization, but because of the existing evidence it seems appropriate, at least initially, to minimize the concurrent use of marijuana and alcohol in public.

Early signs suggest public health harms may be responsive to policy changes

Figure 1. Quarterly average proportion of drivers involved in fatal crashes who were positive for THC and modeled seasonally-adjusted linear trend before and after Washington Initiative 502 took effect on 6 December 2012 legalizing recreational use of marijuana for adults aged 21 years and older, Washington, 2010 – 2014.



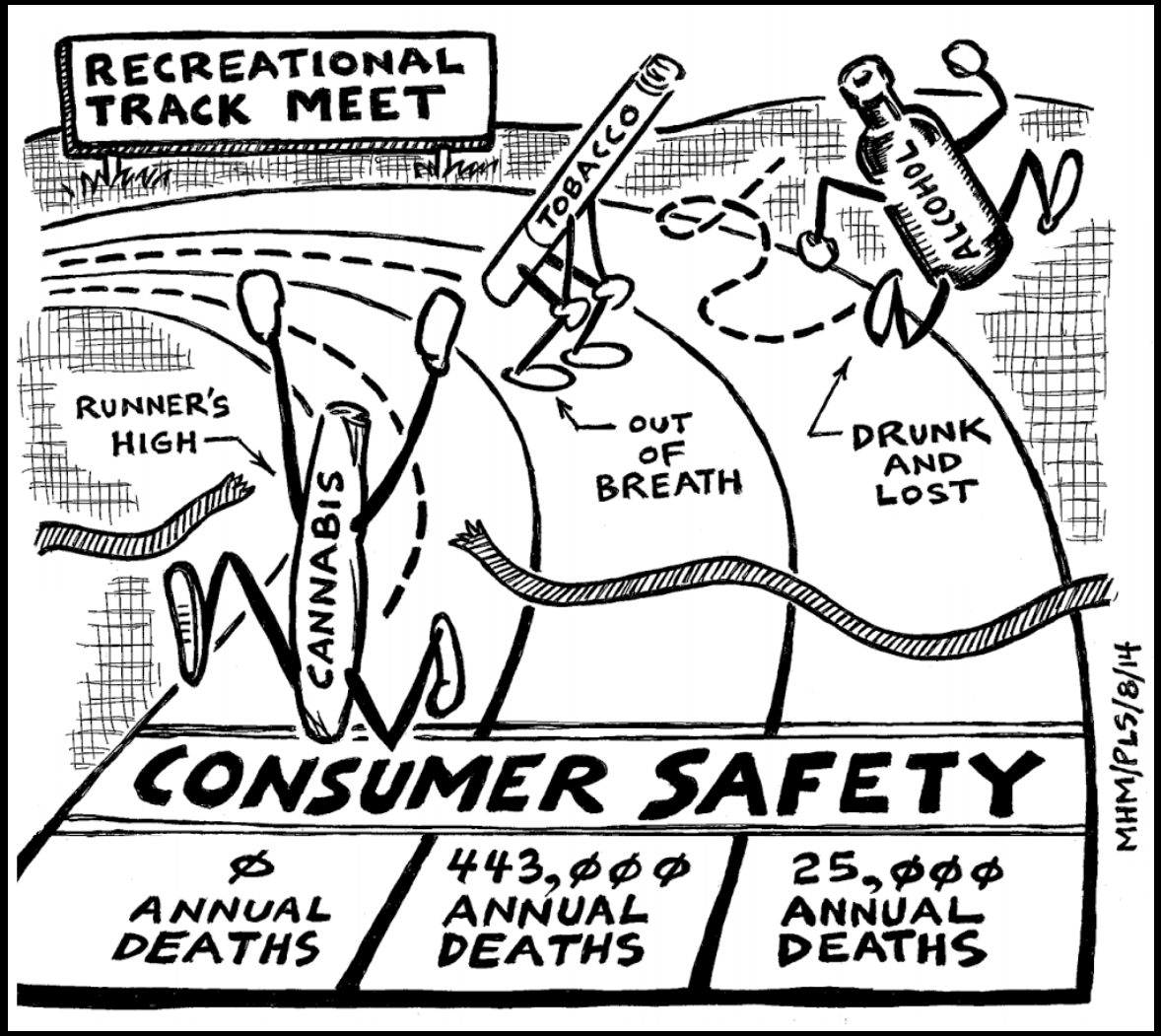
Data: Washington Traffic Safety Commission, 2010 – 2014.

More than half of THC+ fatal crashes involve MJ and other substances (usually alcohol)

Table 4. Presence of alcohol and other drugs among THC-positive drivers involved in fatal crashes, by year and survival status, Washington, 2010 – 2014.

	Total THC-positive Drivers	Other substances present							
		None (THC only)		Alcohol		Other drugs		Alcohol and other drugs	
		N (Row %)							
All drivers	303	103	(34.0)	118	(39.0)	50	(16.5)	32	(10.5)
Survival status									
Died	173	42	(24.1)	76	(44.2)	35	(20.2)	20	(11.5)
Survived	130	61	(47.0)	42	(32.2)	15	(11.6)	12	(9.1)
Year									
2010	53	16	(30.1)	23	(43.7)	9	(17.2)	5	(9.1)
2011	48	14	(29.5)	22	(46.0)	6	(11.9)	6	(12.6)
2012	48	20	(42.8)	15	(32.3)	8	(17.2)	4	(7.8)
2013	49	14	(27.6)	22	(44.3)	7	(14.7)	7	(13.5)
2014	106	39	(37.0)	36	(34.2)	20	(18.8)	11	(10.0)

We need to focus not just on dose-response relationships for MJ use alone



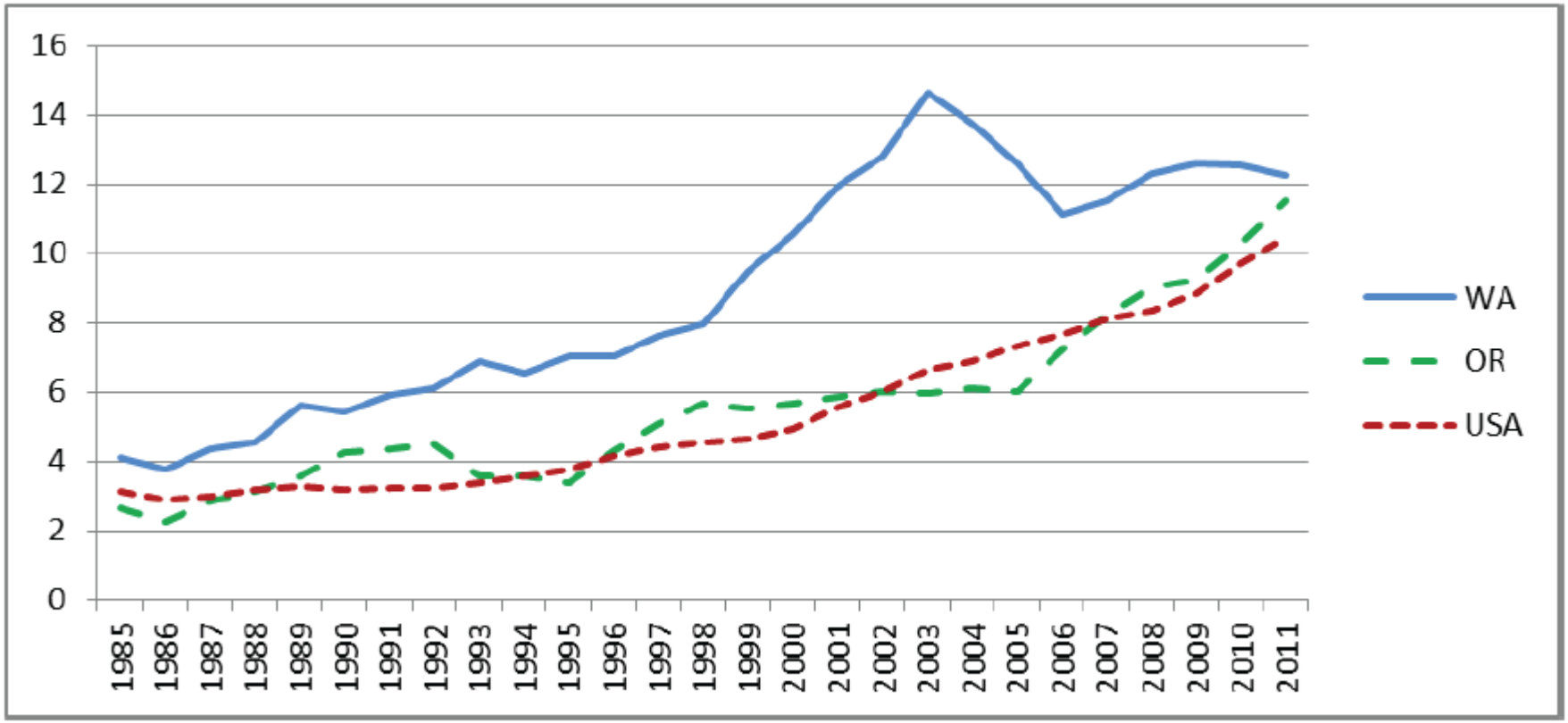
Some of the latest findings on simultaneous use of MJ with:

- **Tobacco:**
  - **E-cigarettes: 2014 CT survey of HS seniors, 18.4% of lifetime MJ users reported using e-cigarette for MJ (Morean et al., 2015)**
  - **Blunts: 2013 NSDUH survey reveals 4.6% of HH population uses blunts; more teenagers (ages 12-17) use blunts then MJ alone (Cohn et al, 2015)**

- **Alcohol use**
  - **2005 & 2010 NAS reveals that simultaneous use of alcohol and marijuana is more common than concurrent use, particularly for youth and young adults (Subbaraman and Kerr, 2015)**

We can't presume that previous studies of MJ's effects on health are the same today

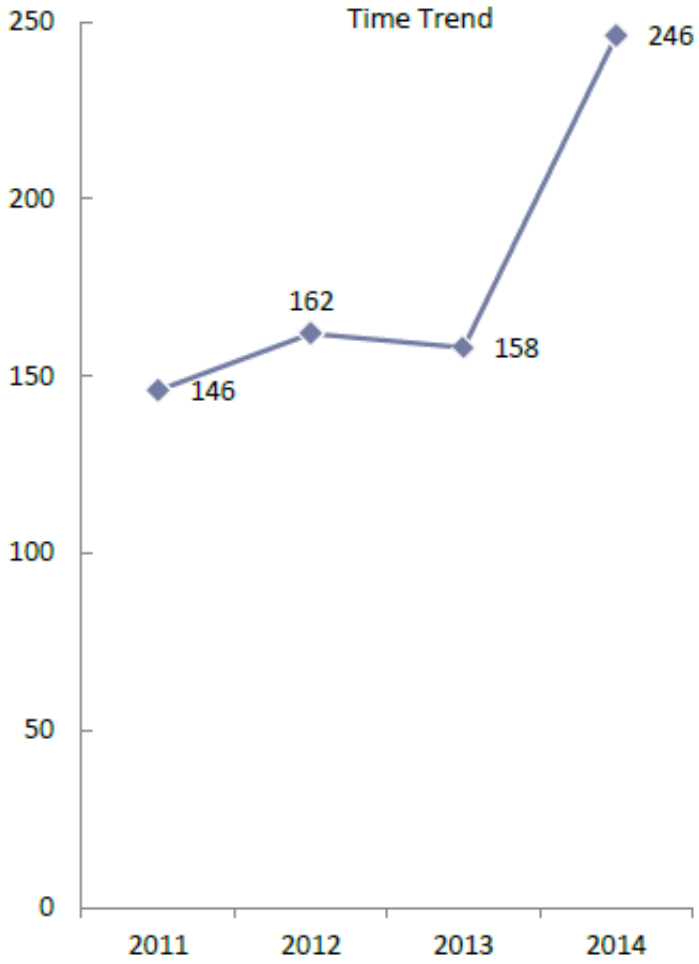
Figure C.4. Average THC Potency (Percentage) Over Time

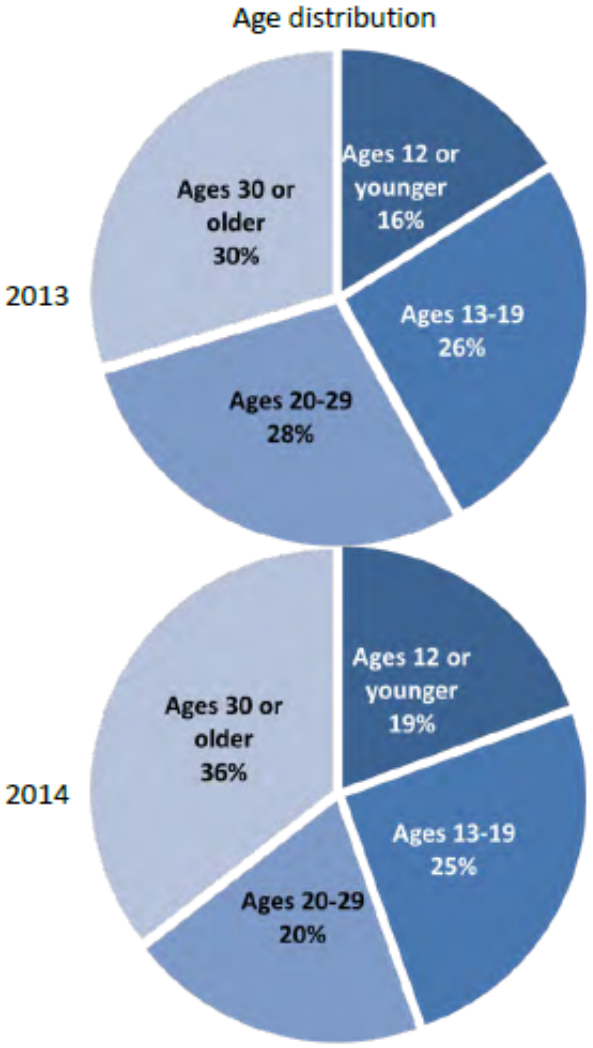


1.6 Poisonings

Marijuana-related calls to the Washington Poison Center were relatively constant from 2011 to 2013, but those calls increased from 158 in 2013 to 246 in 2014. The percentages of calls by age group were, however, similar in 2013 and 2014, especially when taking into consideration the relatively small numbers involved in 2013, with those ages 30 or older constituting the largest percentage and those ages 12 or younger the smallest.

Source: Washington Poison and Drug Information Center





In Summary

- **What we know:**
  - **Marijuana laws are changing rapidly; data to evaluate the impacts of these legal changes is not changing as rapidly**
  - **One form of legalization is really just one form of legalization.**
  - **The heterogeneity and dynamic nature of these policies make them difficult to evaluate definitively in the short run**
  - **The industry is leading the way in policy right now, as lack of data on harm causes people to infer there is no harm**

- **What we still need to know:**
  - **How does marijuana get consumed? What products, amounts? With what? How does that vary by user groups?**
  - **How do these policies influence consumption? Product choice? Concurrent use with other substances?**
  - **How does the market influence product potency, offering, safety?**
  - **How do we better measure dose-response relationships in current data systems? Does relationship depend on potency alone or does product choice, simultaneous use matter?**