



# **Alcohol, Drugs, and Trauma**

## **A Risky Mix**



## Definitions:

In the Washington State Trauma Registry (WTR):

- Alcohol use is determined by a blood alcohol test
- The legal limits are:
  - Blood alcohol level  $\geq 0.08$  g/dl for adults (age 21+)
  - Blood alcohol level  $\geq 0.02$  g/dl for minors (age <21)
- Drug use is determined by a toxicology report



## Changes in the law

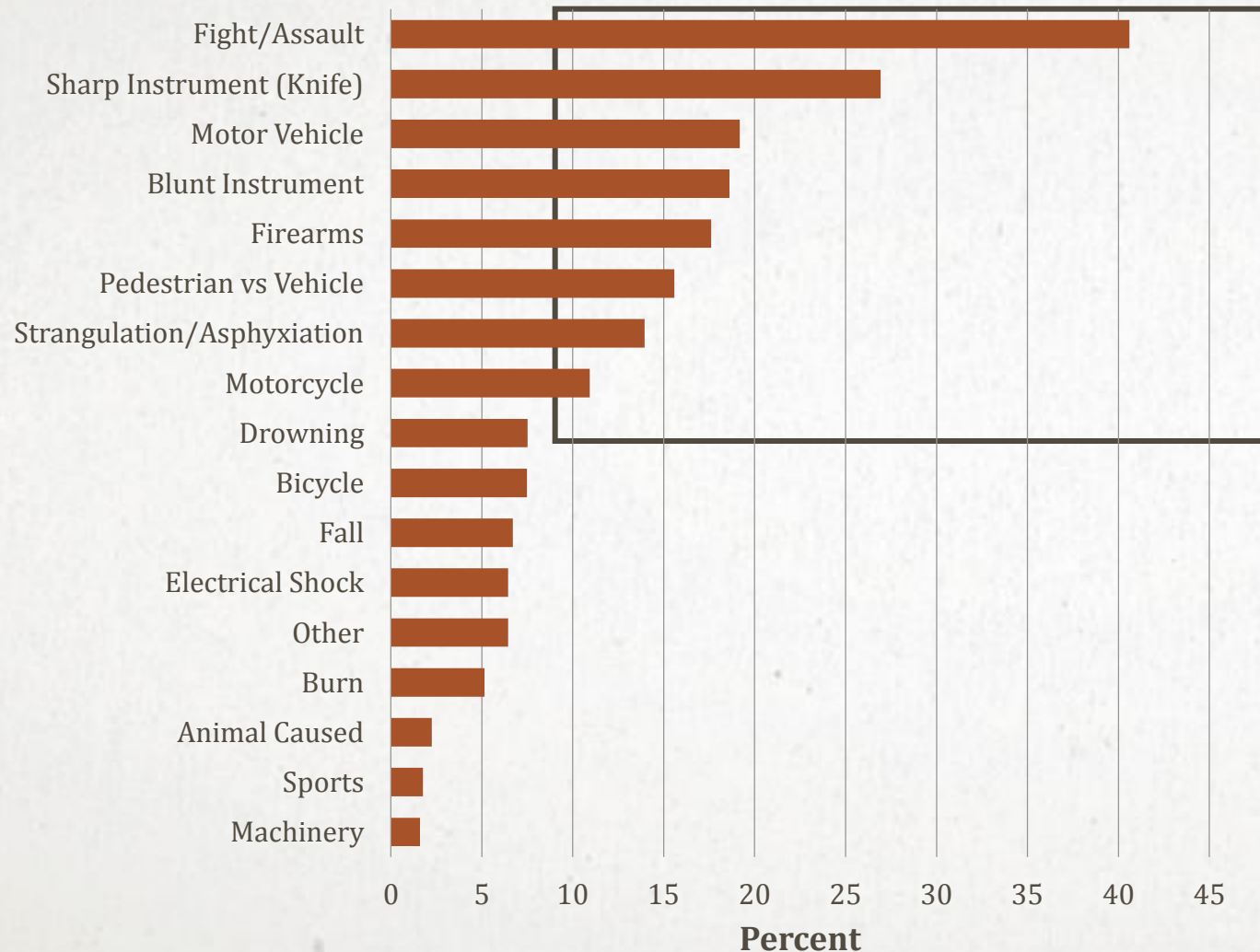
- Title 66 RCW  
Alcohol beverage control law
- Initiative 502  
Legalizing marijuana (cannabis)

## Why look at blood alcohol or toxicology results of trauma patients?

- Burden of traumatic injuries due to alcohol and/or drug consumption
- Changing laws and regulations regarding the use of alcohol and drugs



## The percentage of trauma with blood alcohol levels over legal limits by mechanism of injury, during 2010-2012



## Alcohol is a major contributing factor for:

- Fights
- Stabbings
- Motor vehicle related trauma
- Firearms
- Strangulations



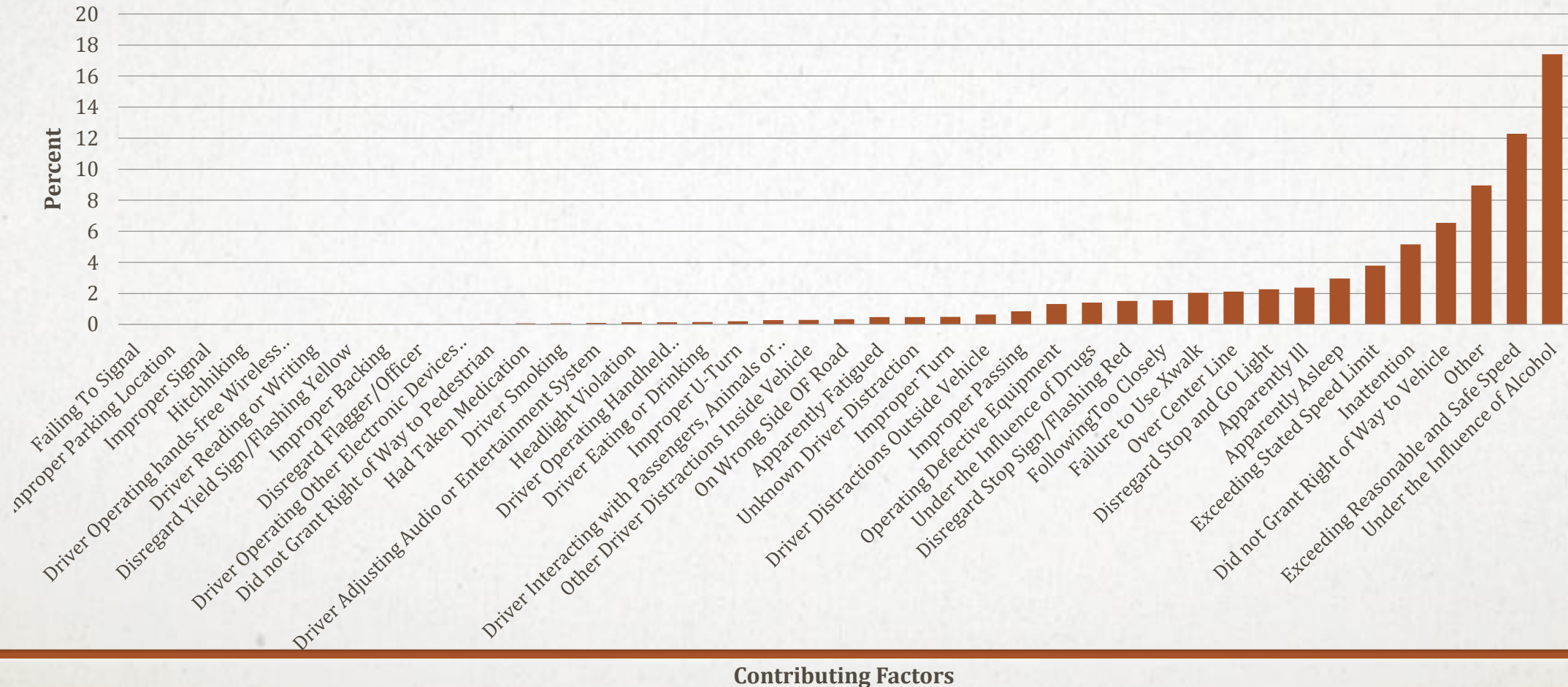


# The linked collision-WTR dataset shows that alcohol is one of the major contributing factors for driver and pedestrian trauma, 2008-2010

(MV occupants are excluded)



Contributing circumstances for MV drivers and pedestrians, 2008-2010

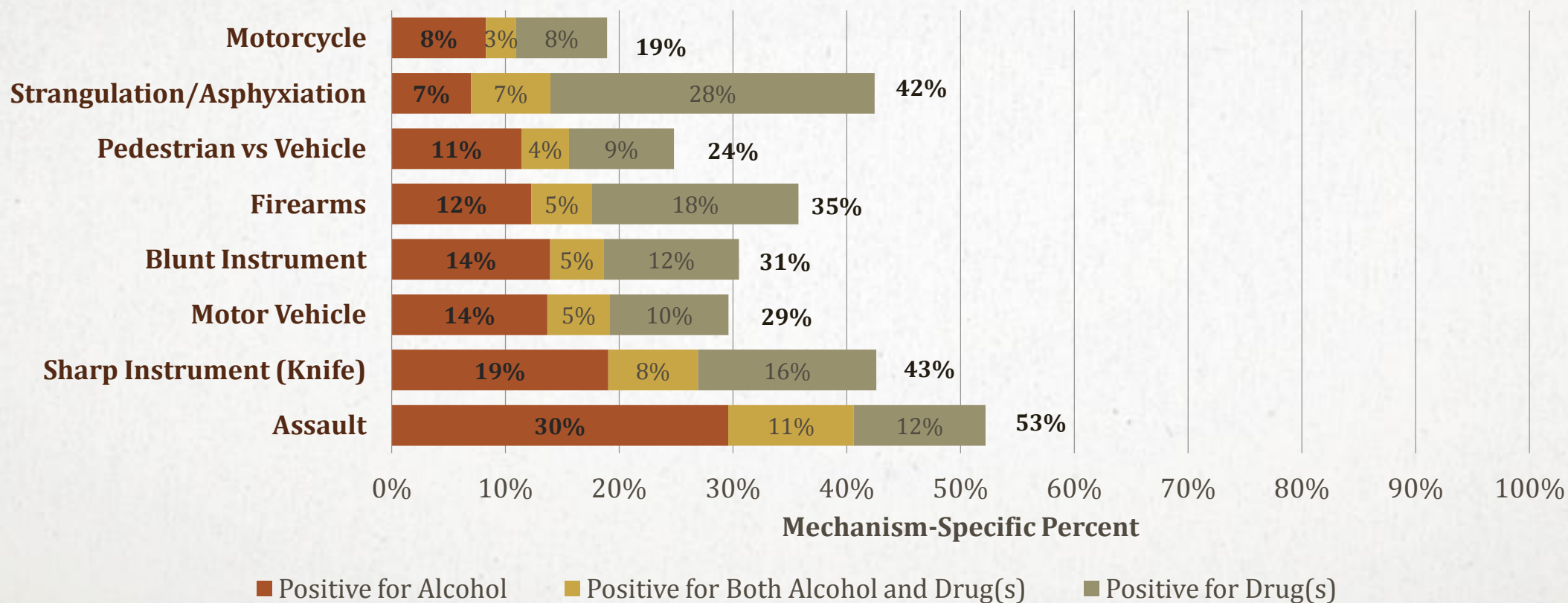


Data Source: The linked DOT collision and DOH WTR dataset

# The selected injury mechanisms below have high percentages of patients who are positive for both alcohol and drugs



The percentage of alcohol and drug use in WTR for selected mechanisms during 2010-2012

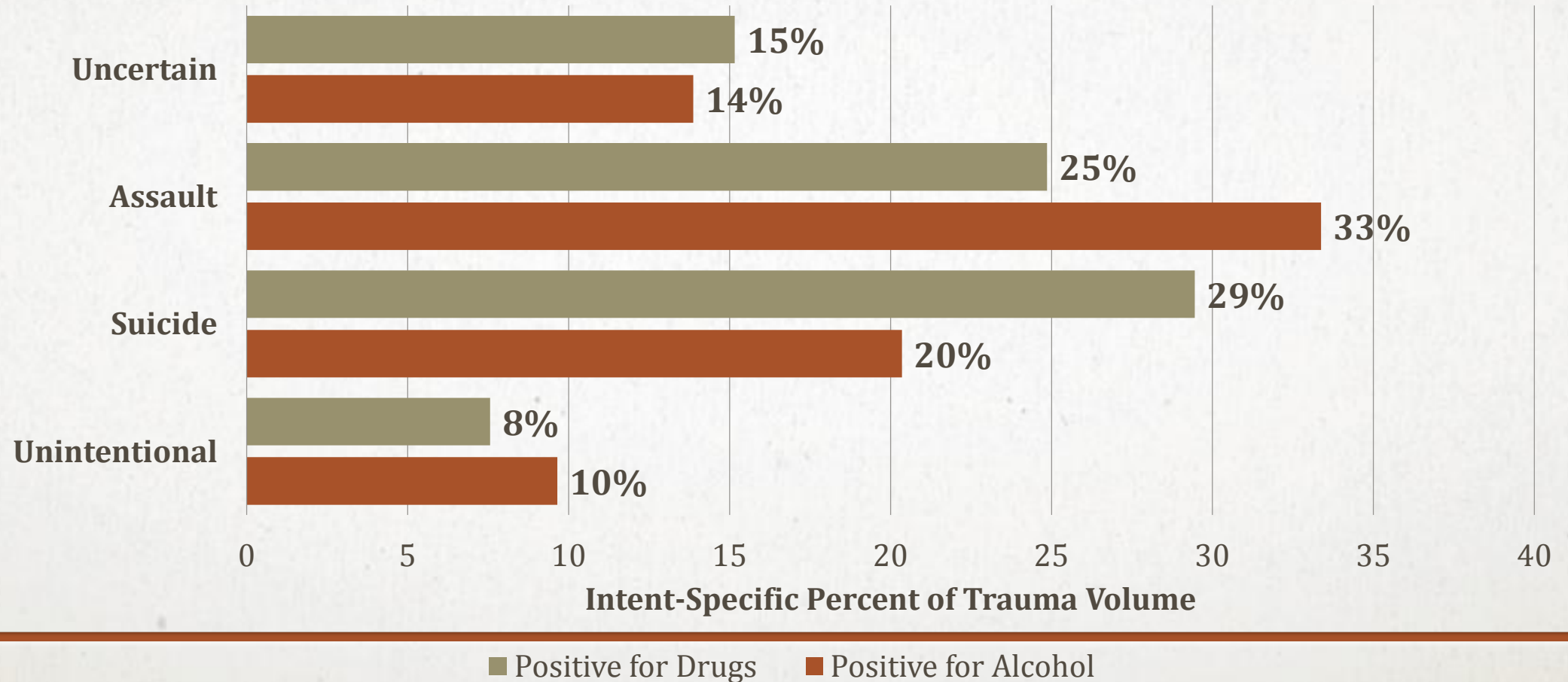


# Use of alcohol and drugs by the intent of injury

(DOH inclusion criteria, excluding transfers-out, 2010-2012)



The percentage of alcohol and drug use by the intent of injury





# The patients tested positive for alcohol sustain more serious injuries than those patients with no positive test results

(DOH inclusion criteria, excluding transfers-out, 2010-2012)



### Injury Severity Score (ISS) by alcohol use

	No	Yes
<b>Minor</b> ISS 0-8	53.3%	50.0%
<b>Moderate</b> ISS 9-15	26.4%	23.9%
<b>Serious</b> ISS 16-75	16.0%	25.1%

### Injury Severity Score (ISS) by drug use

	No	Yes
ISS 0-8	45.1%	46.8%
ISS 9-15	22.4%	23.6%
ISS 16-75	31.2%	28.2%

p value = 0.000

# The patients tested positive for alcohol and drugs stay longer in the hospital if they sustain serious injuries than those patients with no positive test results

(DOH inclusion criteria, excluding transfers-out, 2010-2012)



Mean hospital length of stay (days) by alcohol use

Minor

	No	Yes
ISS 0-8	2.5	1.9
Moderate		
ISS 9-15	4.7	4.6
Serious		
ISS 16-75	8.0	9.8

Moderate

Serious

p value = 0.000

Mean hospital length of stay (days) by drug use

	No	Yes
ISS 0-8	2.5	2.3
ISS 9-15	4.7	5.2
ISS 16-75	8.0	9.7

p value = 0.000

# Use of alcohol and drugs does not necessarily increase the likelihood of death for all age groups in the trauma registry

(DOH inclusion criteria, excluding transfers-out, 2010-2012)



## Case fatality by alcohol use

	Not Positive	Positive
Age 15-24	2.3%	2.1%
Age 25-34	3.4%	2.2%
Age 35-44	2.9%	1.5%
Age 45-54	2.9%	4.3%
Age 55-64	3.8%	6.0%
Age 65-74	4.8%	5.2%
Age 75-84	6.3%	2.7%
Age 85+	8.0%	9.5%
Total	3.9%	3.1%

## Case fatality by drug use

	Not Positive	Positive
	2.5%	1.8%
	2.2%	2.8%
	2.1%	3.0%
	4.6%	3.1%
	6.9%	6.5%
	7.1%	10.3%
	16.1%	10.1%
	19.32%	10.0%
	4.8%	3.3%





# Patients tested positive for alcohol are more likely to be sent to the ICU from the ED than patients with no positive test results (DOH inclusion criteria, excluding transfers-out, 2010-2012)

ED disposition to ICU by alcohol use and ISS

	No	Yes
Minor ISS 0-8	2.5%	7.8%
Moderate ISS 9-15	7.4%	18.0%
Serious ISS 16-75	32.8%	46.1%

ED disposition to ICU by drug use and ISS

	No	Yes
ISS 0-8	9.8%	9.7%
ISS 9-15	21.3%	19.6%
ISS 16-75	51.6%	49.4%

p value = 0.000



**In comparison to the patients who are not positive for alcohol, the patients tested positive for alcohol have shorter ICU stays if they have minor or moderate injuries, but they have longer stays in the ICU if their injuries are serious**  
(DOH inclusion criteria, excluding transfers-out, 2010-2012)

**Mean ICU Length of stay (days) by alcohol use and ISS**

	No	Yes
<b>Minor</b> ISS 0-8	2.2	1.6
<b>Moderate</b> ISS 9-15	2.3	1.9
<b>Serious</b> ISS 16-75	4.0	5.3

**Mean ICU length of stay (days) by drug use and ISS**

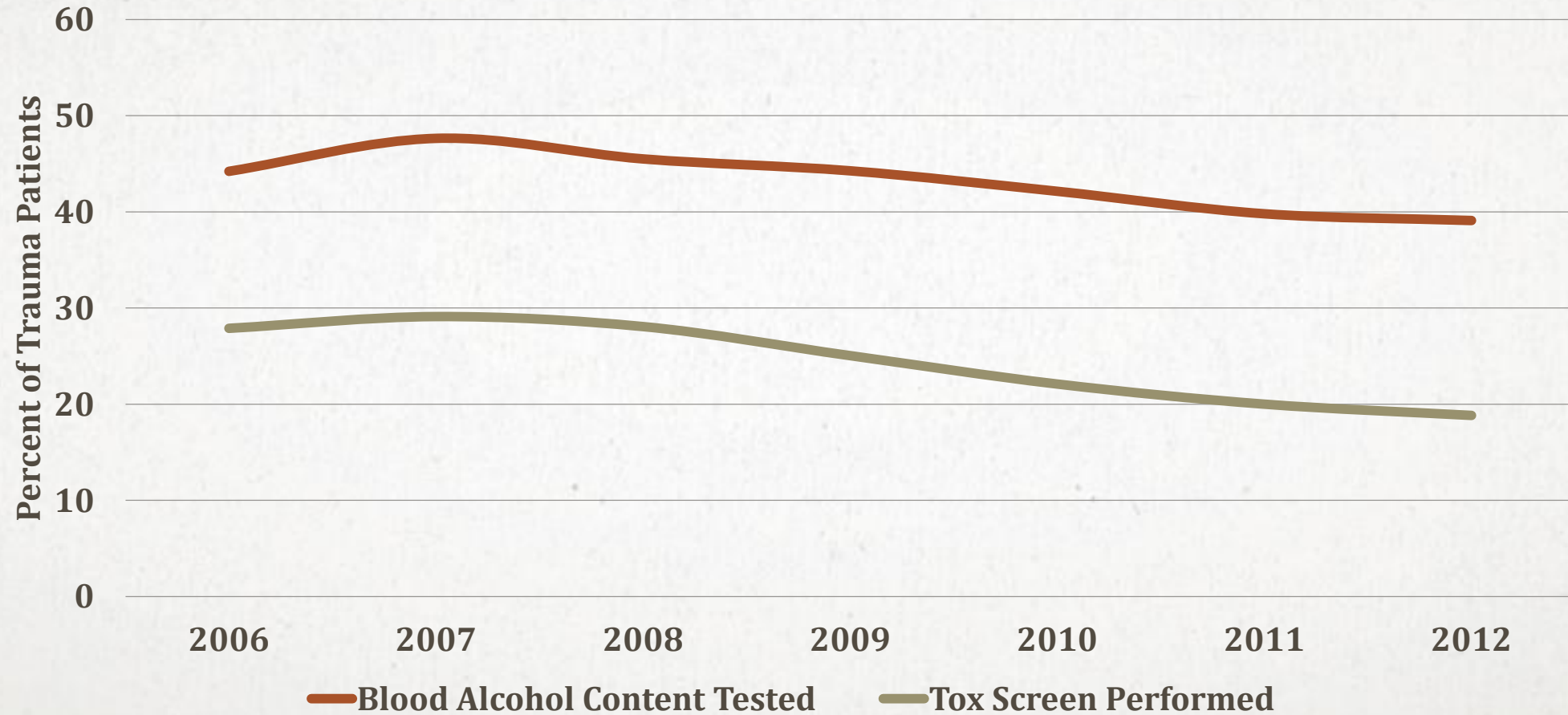
	No	Yes
ISS 0-8	2.1	2.1
ISS 9-15	2.2	2.0
ISS 16-75	4.2	4.3

p values = 0.000



# About 1 in every 2 patients receiving definitive trauma care are screened for blood alcohol levels while only 1 in 4-5 are screened for toxicology

(DOH inclusion criteria, excluding transfers-out)







# 18% of all traumatic injuries tested positive for alcohol, drugs or both

(DOH inclusion criteria, excluding transfers-out, 2010-2012)

	No Alcohol Use	Tested Positive for Alcohol
No Drug Use	49,497 (82.5%)	5,104 (8.5%)
Tested Positive for Drugs	3,727 (6.2%)	1,687 (2.8%)

p value = 0.000

# WTR shows males are more likely to test positive for alcohol and drugs than females

(DOH inclusion criteria, excluding transfers-out, 2010-2012)



# Nearly half of WTR patients with serious injuries (ISS 16+) who test positive for alcohol or drugs are either on Medicaid or self-pay



(DOH inclusion criteria, excluding transfers-out, 2010-2012)

## Positive for alcohol

	No (Col%)	Positive (Col%)
None	3.0	5.3
Medicare	27.4	8.0
Medicaid	13.1	20.2
Labor & Industries	4.7	2.2
HMO	8.4	7.1
Other Insurance	8.6	9.8
Self-Pay	6.7	14.7
Commercial Insurance	15.4	16.3
Health Care Service	8.5	8.8
Other Sponsored	2.5	3.2
Charity Care	1.7	4.5

## Positive for drugs

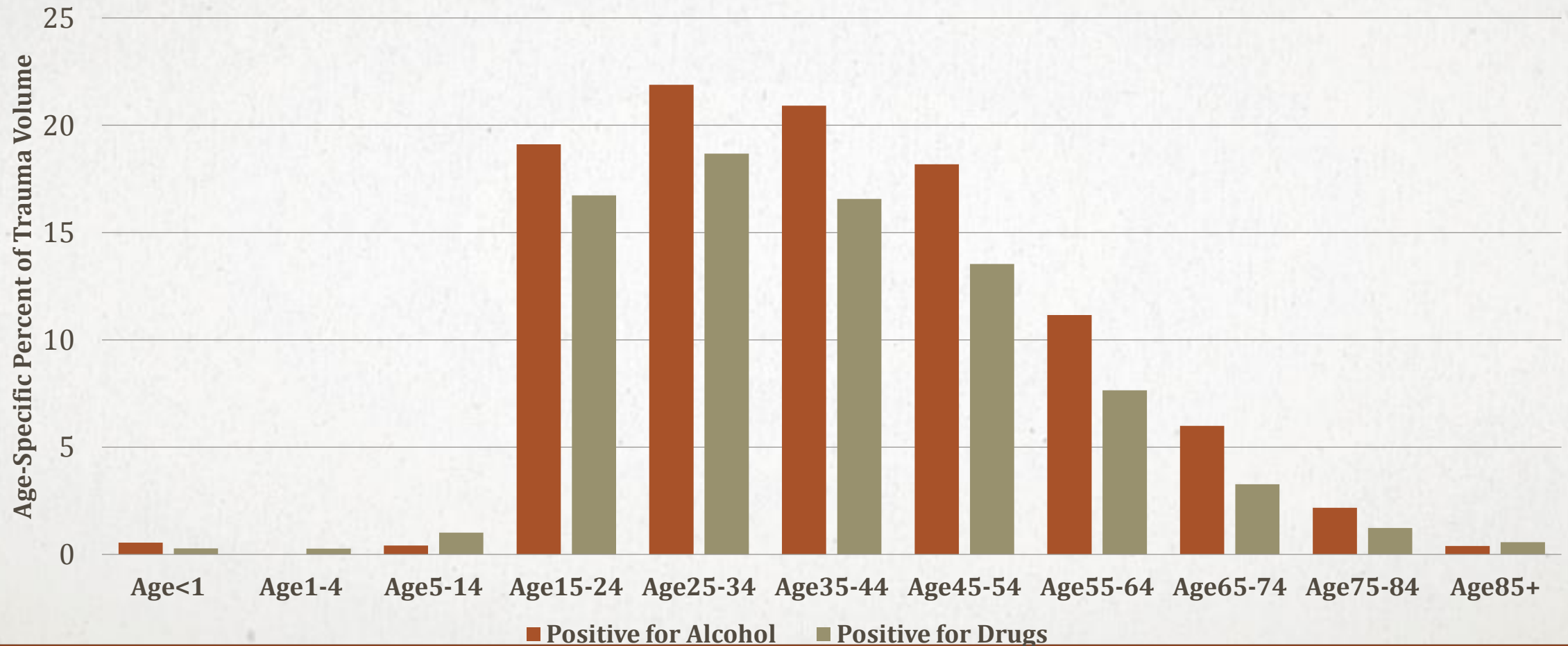
No (Col%)	Positive (Col%)
2.3	5.6
14.2	7.7
13.3	23.9
4.7	5.2
8.6	6.1
10.0	7.0
8.7	13.7
20.2	12.9
9.5	7.5
2.8	1.9
2.2	4.3



# Trauma patients in their twenties have the highest exposure to alcohol and drugs



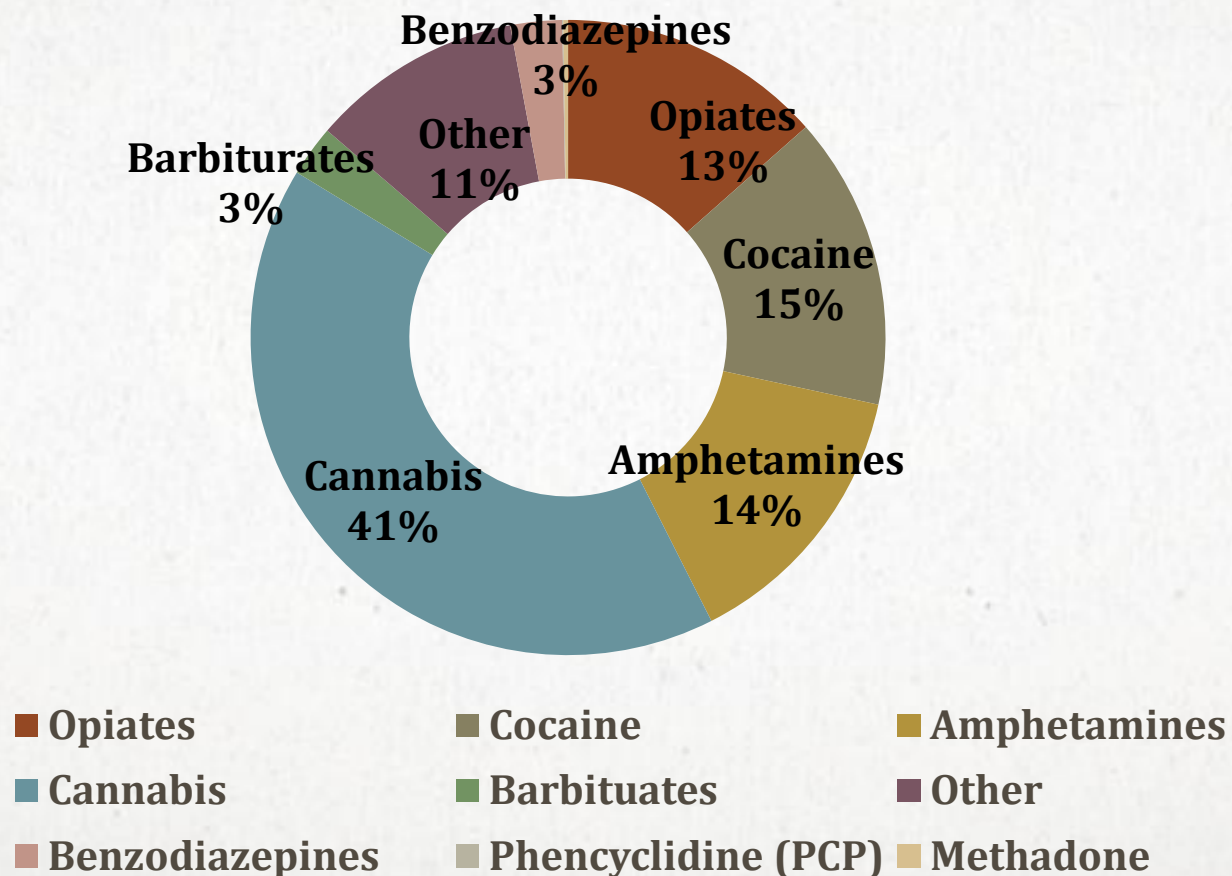
(DOH inclusion criteria, excluding transfers-out, 2010-2012)





# Cannabis is the most common drug found in the registry followed by cocaine, amphetamines and opiates

(DOH inclusion criteria, excluding transfers-out, based on the first drug reported, 2010-2012)

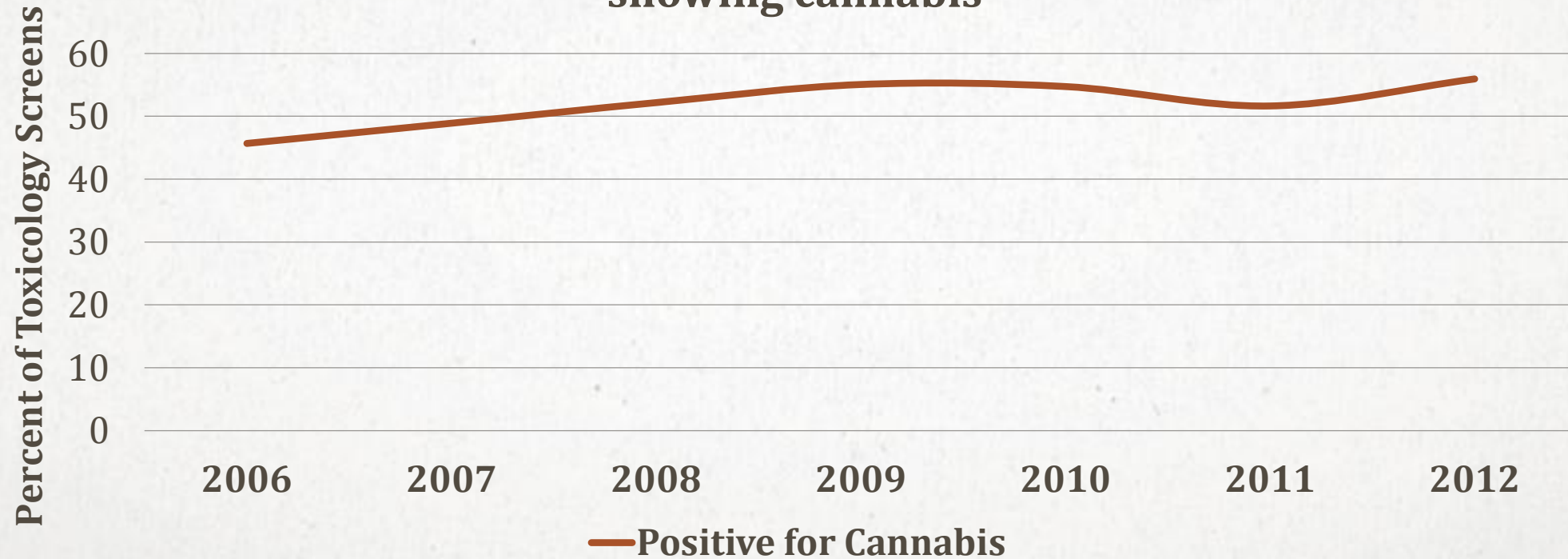


# Cannabis is the most widely used drug among trauma patients positive for drugs

(DOH inclusion criteria, excluding transfers-out, based on all drugs entered in the registry)



### Percentage of trauma records with toxicology reports showing cannabis

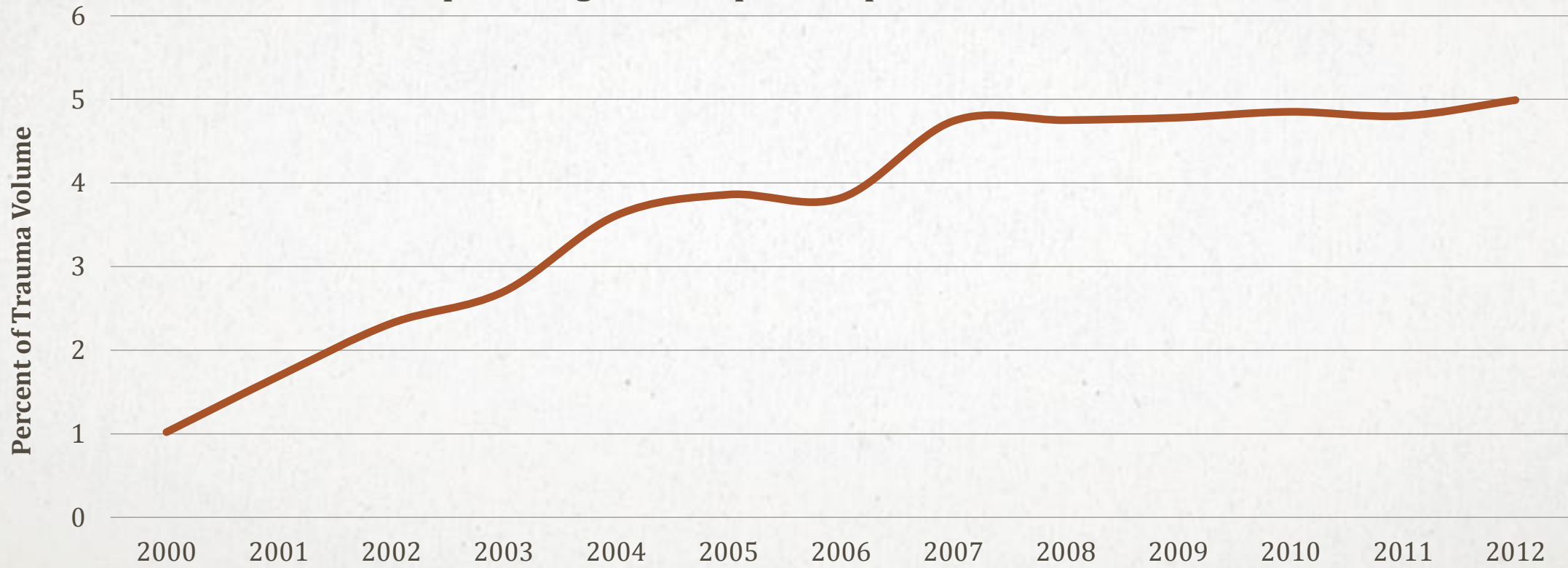


# Cannabis use in the registry during 2000-2012

DOH inclusion criteria, excluding transfers-out, based on all drugs entered in the registry)



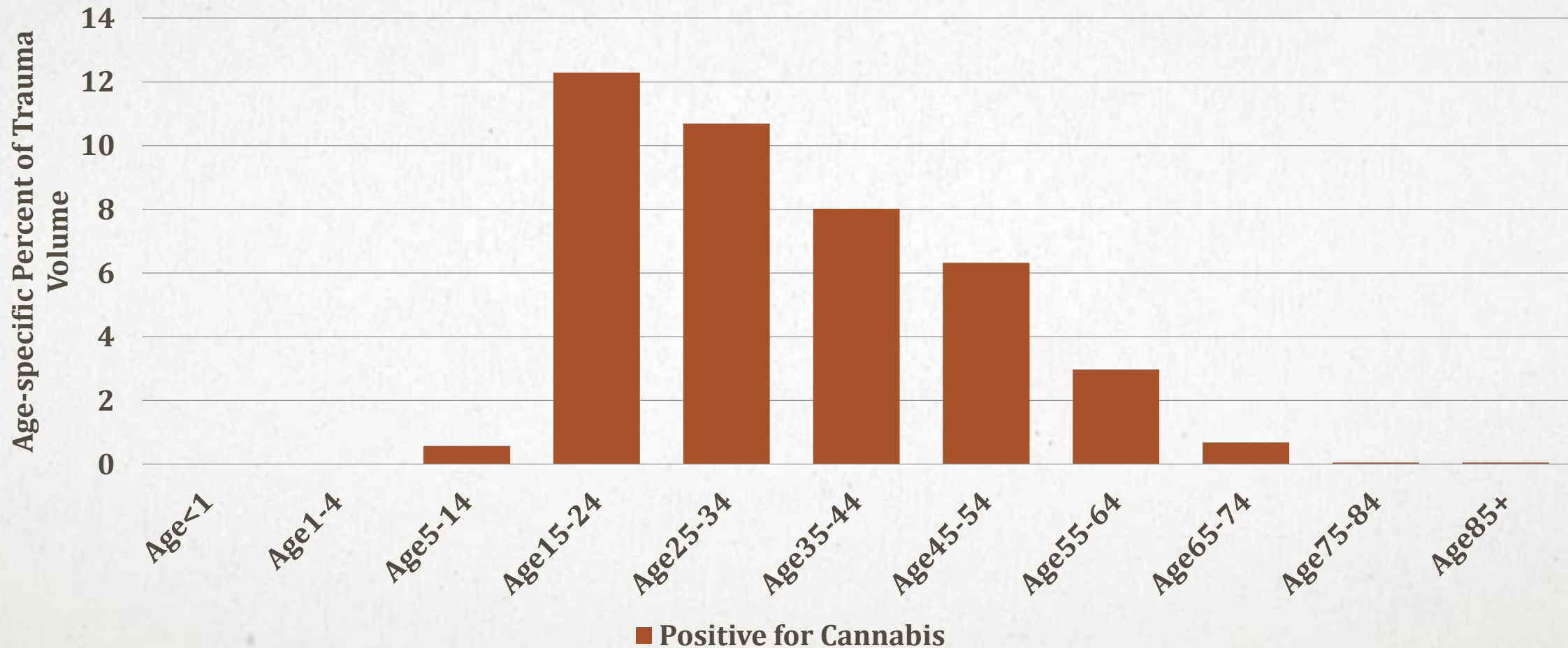
The percentage of WTR patients positive for cannabis





# WTR shows trauma patients in their teens and twenties have the highest exposure to cannabis

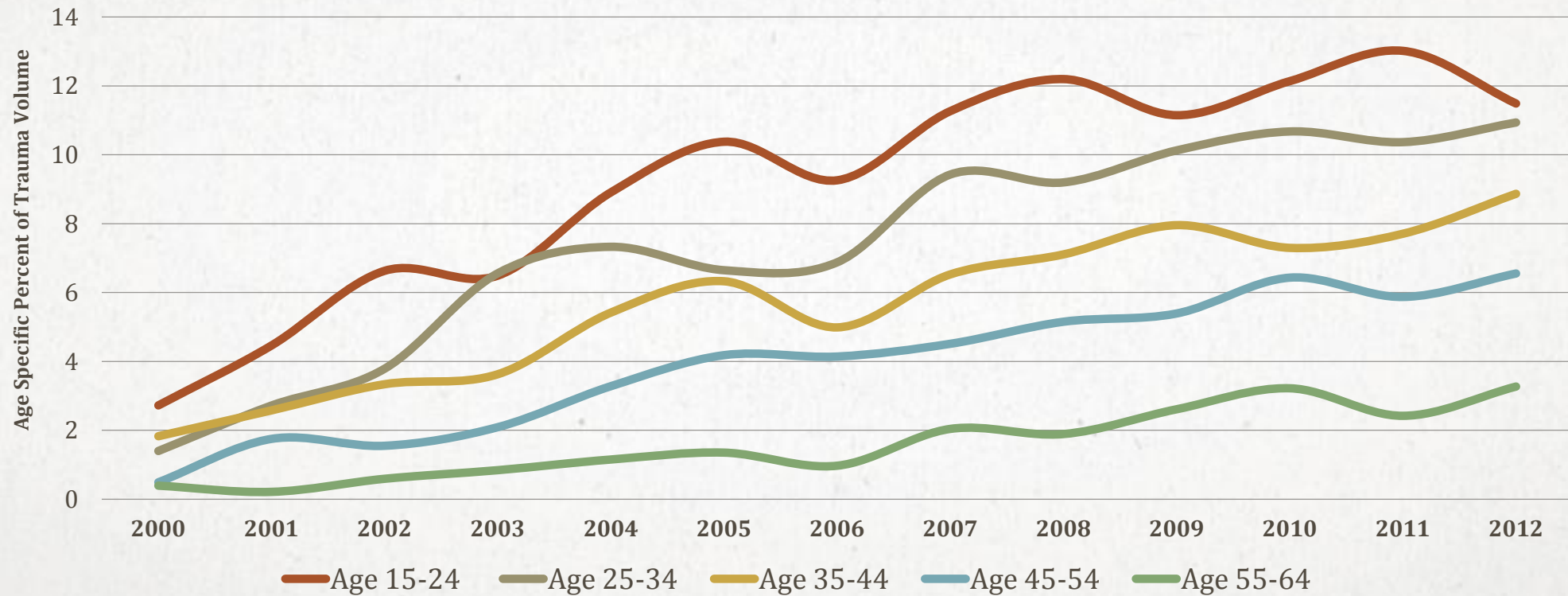
(DOH inclusion criteria, excluding transfers-out, based on all drugs entered in the registry, 2010-2012)



# Cannabis use in the registry went up in all age groups (DOH inclusion criteria, excluding transfers-out, based on all drugs entered in the registry, 2010-2012)

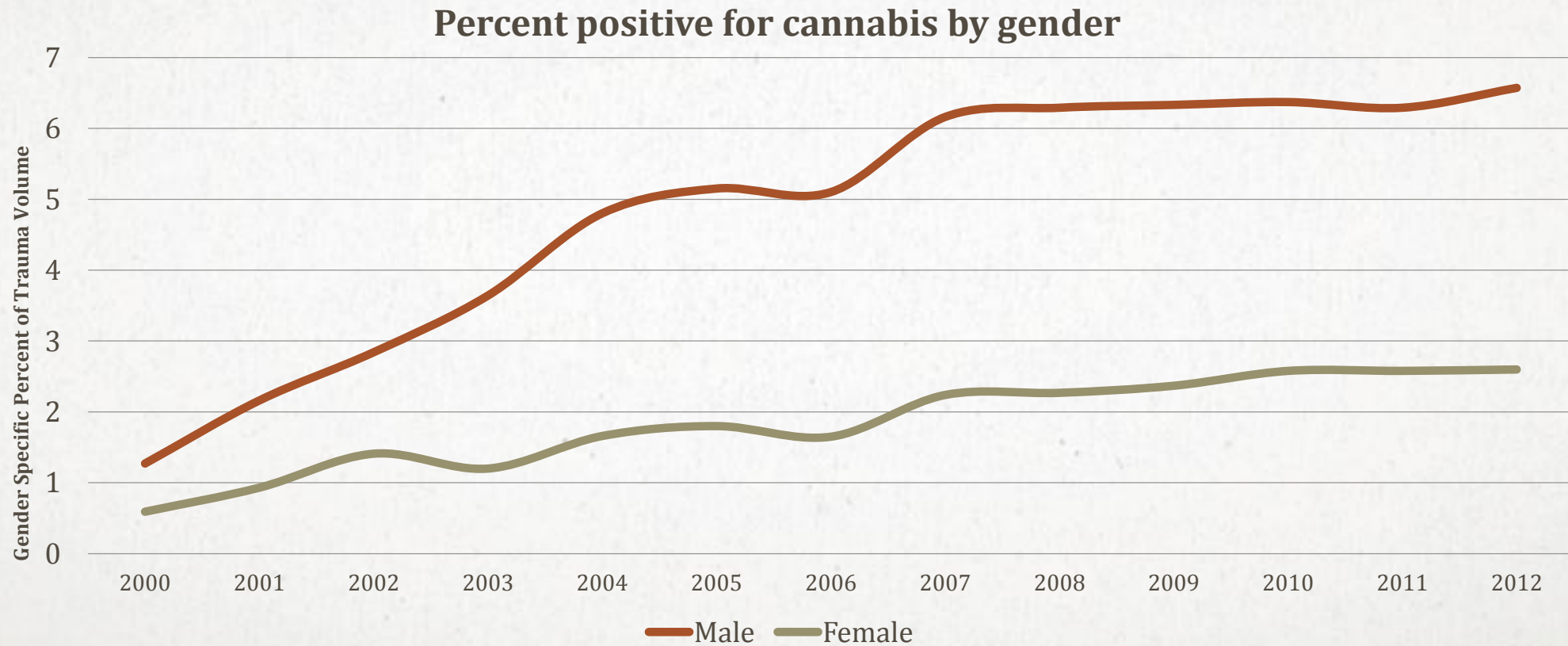


### Percent positive for cannabis by age



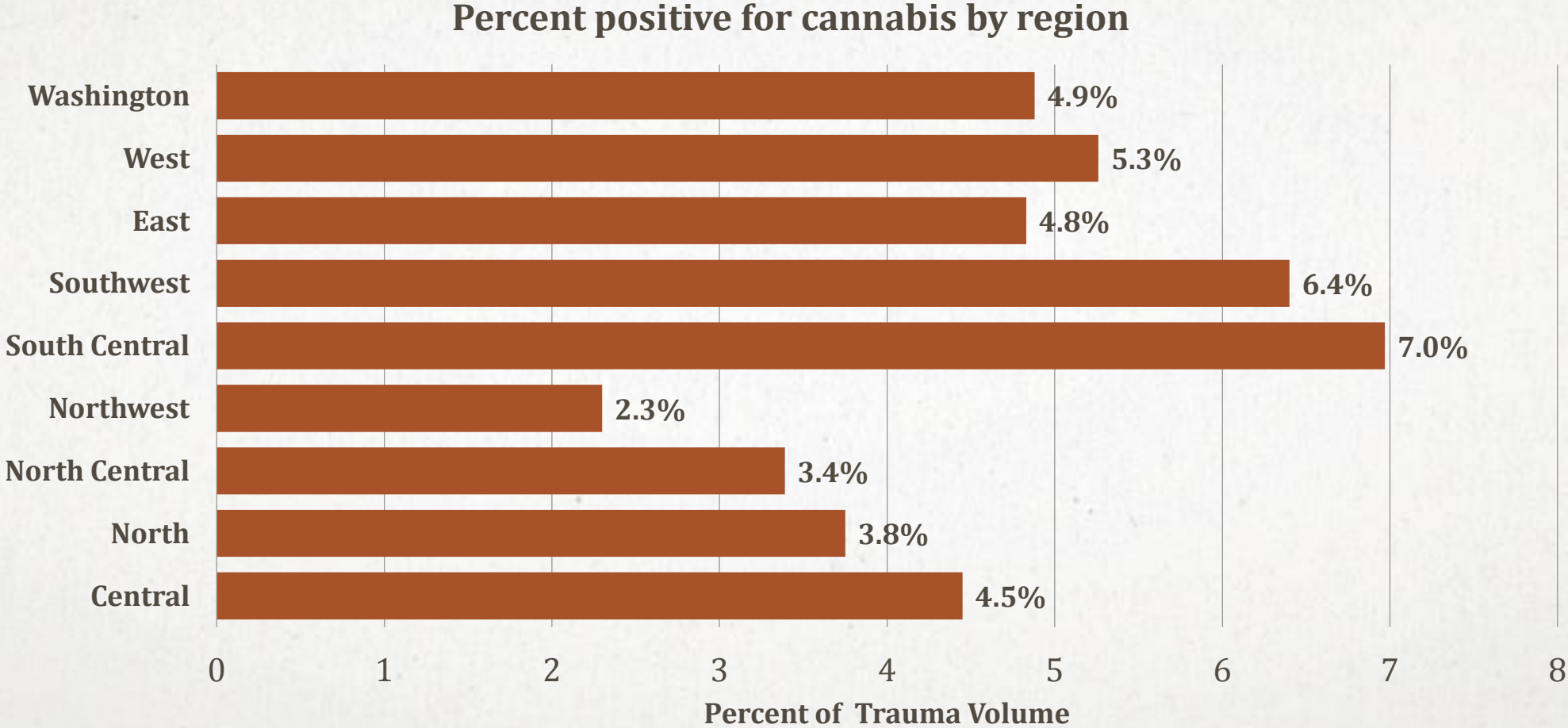
# Cannabis use in the registry went up most drastically in males

(DOH inclusion criteria, excluding transfers-out, based on all drugs entered in the registry, 2010-2012)



# Regional comparison of cannabis-related trauma

(DOH inclusion criteria, excluding transfers-out, 2010-2012)

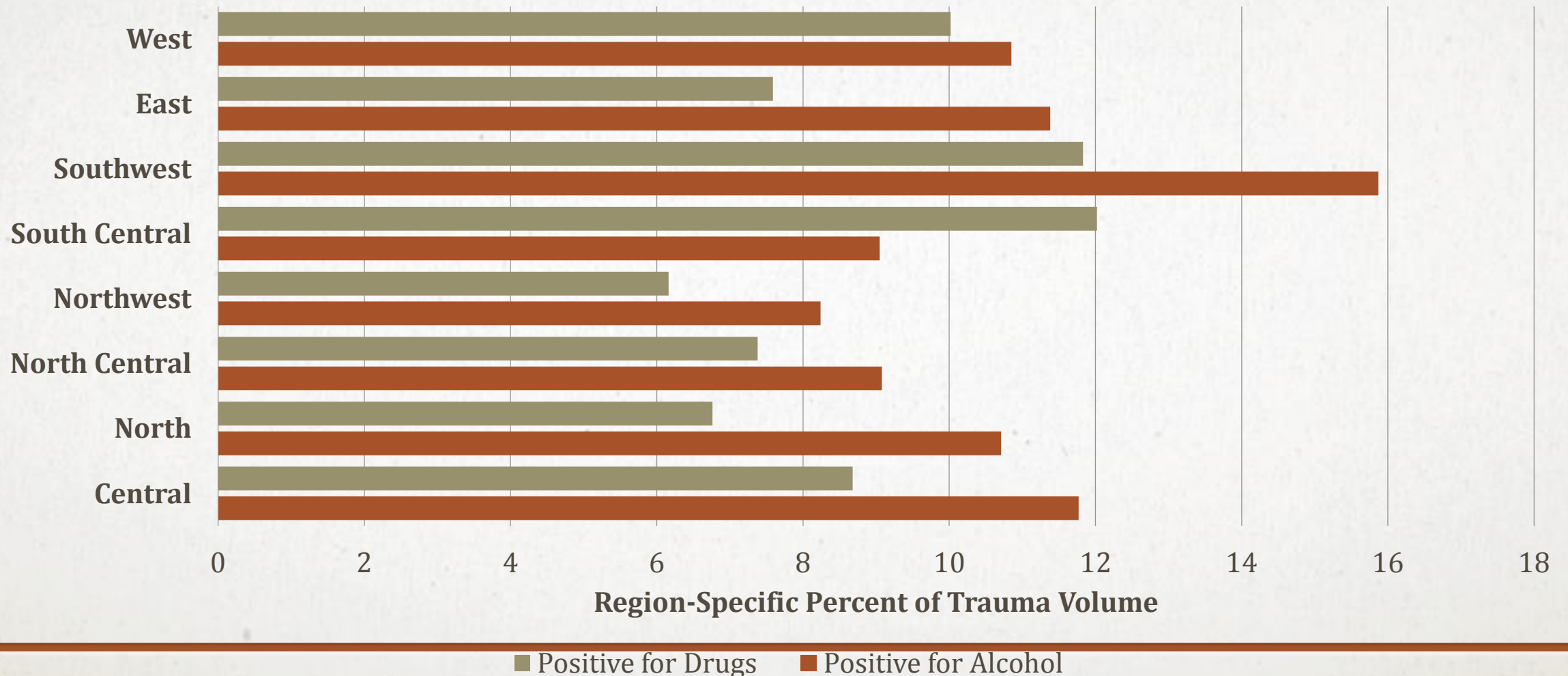




# Regional comparisons of alcohol and drug-related trauma



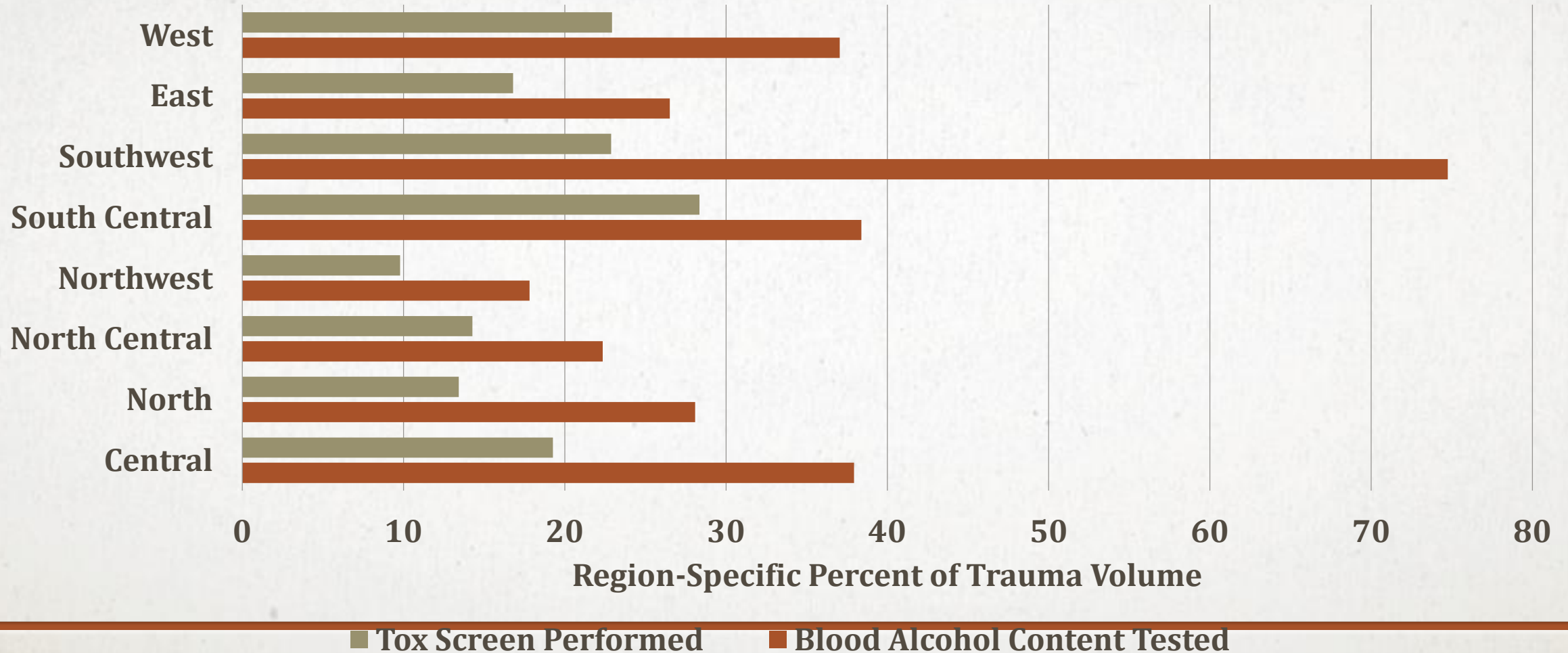
(DOH inclusion criteria, excluding transfers-out, 2010-2012)



# Regional comparisons of blood alcohol and toxicology screenings



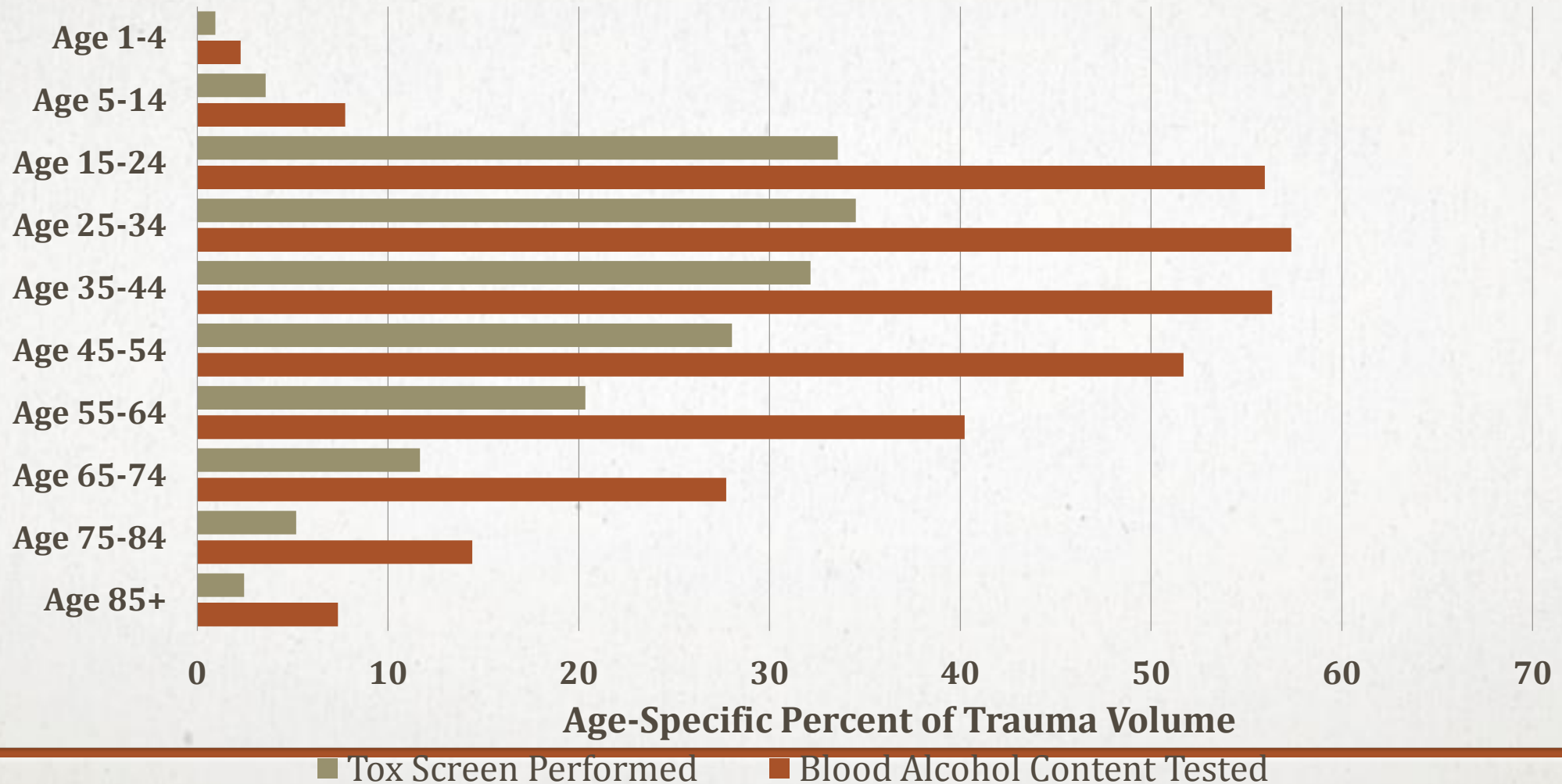
(DOH inclusion criteria, excluding transfers-out, 2010-2012)



# Age comparisons of blood alcohol and toxicology screenings

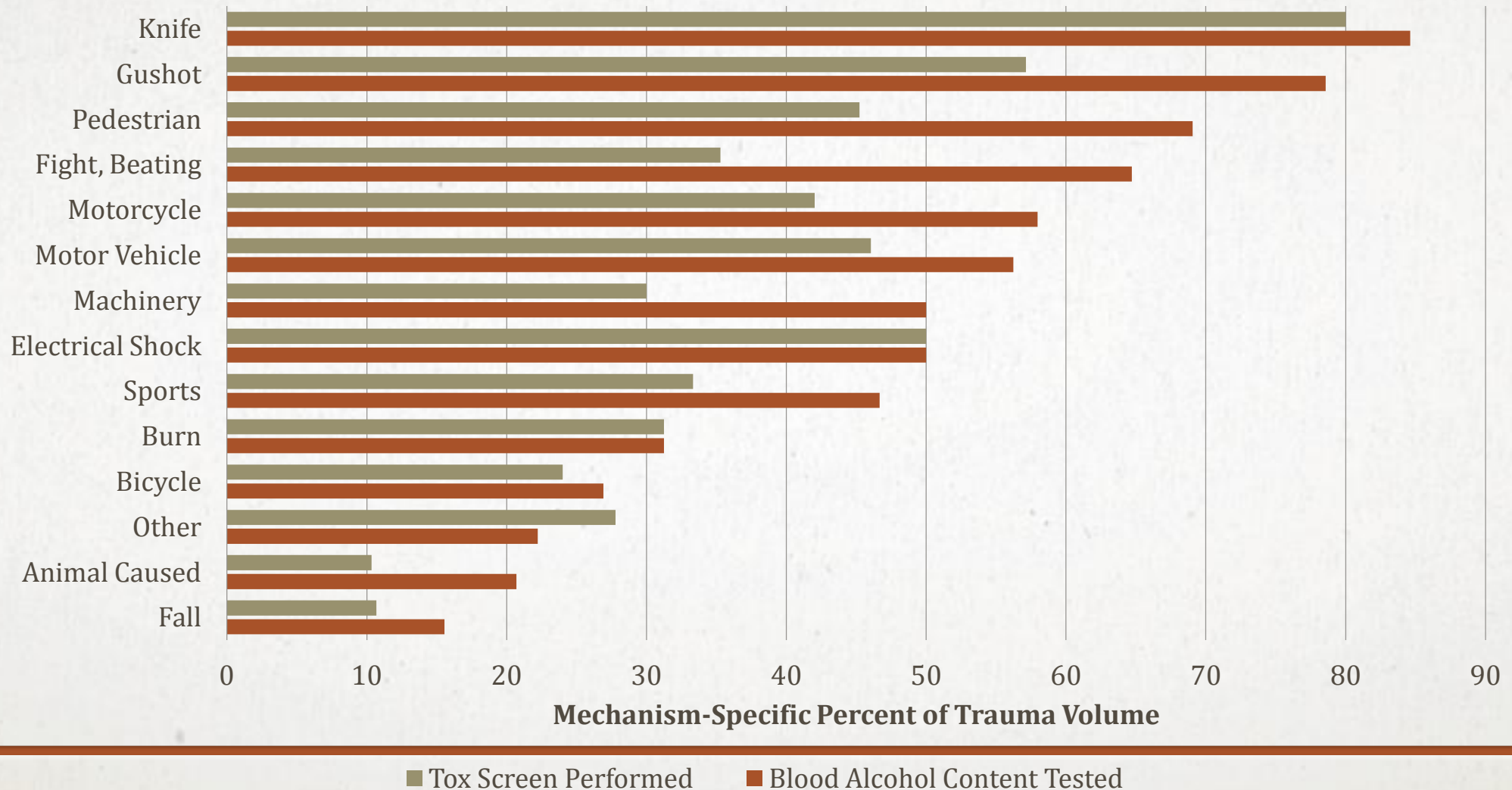


(DOH inclusion criteria, excluding transfers-In, 2010-2012)



# Comparison of blood alcohol and toxicology screenings by mechanism of injury

(DOH inclusion criteria, excluding transfers-In, 2010-2012)





## Why look at blood alcohol or toxicology results of trauma patients?



- Evidence shows that alcohol and drugs are major contributing factors for MV related trauma, gunshot wounds, assaults, and stabbings.
- About 1 in every 2 patients receiving definitive trauma care are screened for blood alcohol levels while only 1 in 4-5 of them are screened for toxicology in the trauma registry.
- 18% of all traumatic injuries tested positive for either alcohol or drugs or both. About 1/3rd of those in the registry who tested positive for alcohol also tested positive for one or more drugs.
- Cannabis is the most common drug found in the registry followed by cocaine, amphetamines and opiates, and its use is on the rise.
- Trauma patients in their teens and twenties have the highest exposure to both drugs and alcohol.
- Men are more likely to be positive for alcohol and drugs than women. Therefore, young males make up the highest risk group.
- Patients who are positive for alcohol tend to sustain more serious injuries than patients with no blood alcohol. They are also more likely to be admitted to the ICU for more minor injuries.
- Some of the regional variation in the percentages of patients who are positive for alcohol, drugs or both might be due to differences in the screening practices in these regions.
- It is also evident that screening practices change based on the mechanism of injury and other patient demographics.

# Thanks

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