Profiles of drowsy drivers in the general population

US-Eval Comorbidity Survey [US-ECS]

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Introduction

- From where are coming numbers on drowsiness and accidents?
  - Police reports
  - Transportation & safety, insurance reports
  - Clinical studies for specific diseases
  - And, rarely, from population studies
- Regardless the way to collect the data, the correlations with the death toll are biased
- Population surveys representative of the general population are one of the best ways to assess Sleepiness At Wheel (SAW) and its impact on traffic accidents

Present study

- Is based on a large representative sample of the American general population

- This study has 2 main objectives:

  - To determine how many individuals experience sleepiness while at the wheel of a motor vehicle

  - To identify what are the characteristics of these individuals in terms of:

    - Socio-demographic characteristics

    - Sleep disorders

    - Medical conditions & psychiatric disorders

    - Treatments

Sample

- 19,136 individuals (83.2% participation rate)
- Age range: 18-102 years
- Location: 15 states
  (Arizona, California, Colorado, Florida, Idaho, Missouri, New York, North Carolina, North Dakota, Oregon, Pennsylvania, South Dakota, Texas, Washington, and Wyoming)

13,376 individuals reported driving a motor vehicle (83.8% of the sample)
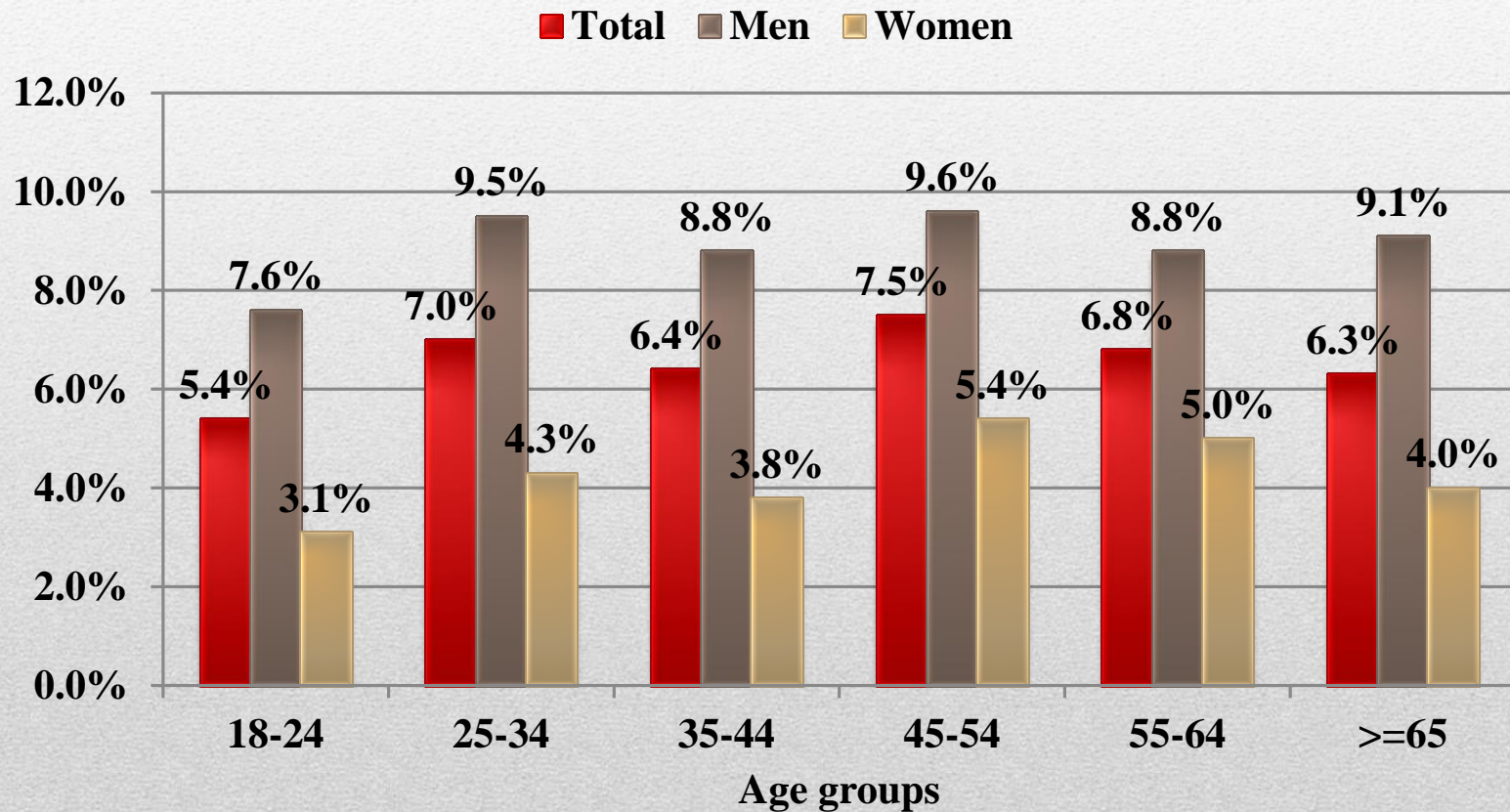
Information collected

- Mental disorder diagnoses according to DSM-IV-TR*

- Sleep disorder diagnoses according to DSM-IV-TR and ICSD-2*

- Organic diseases according to ICD-10

- Psychotropic consumption according to the roster of pharmacological compounds
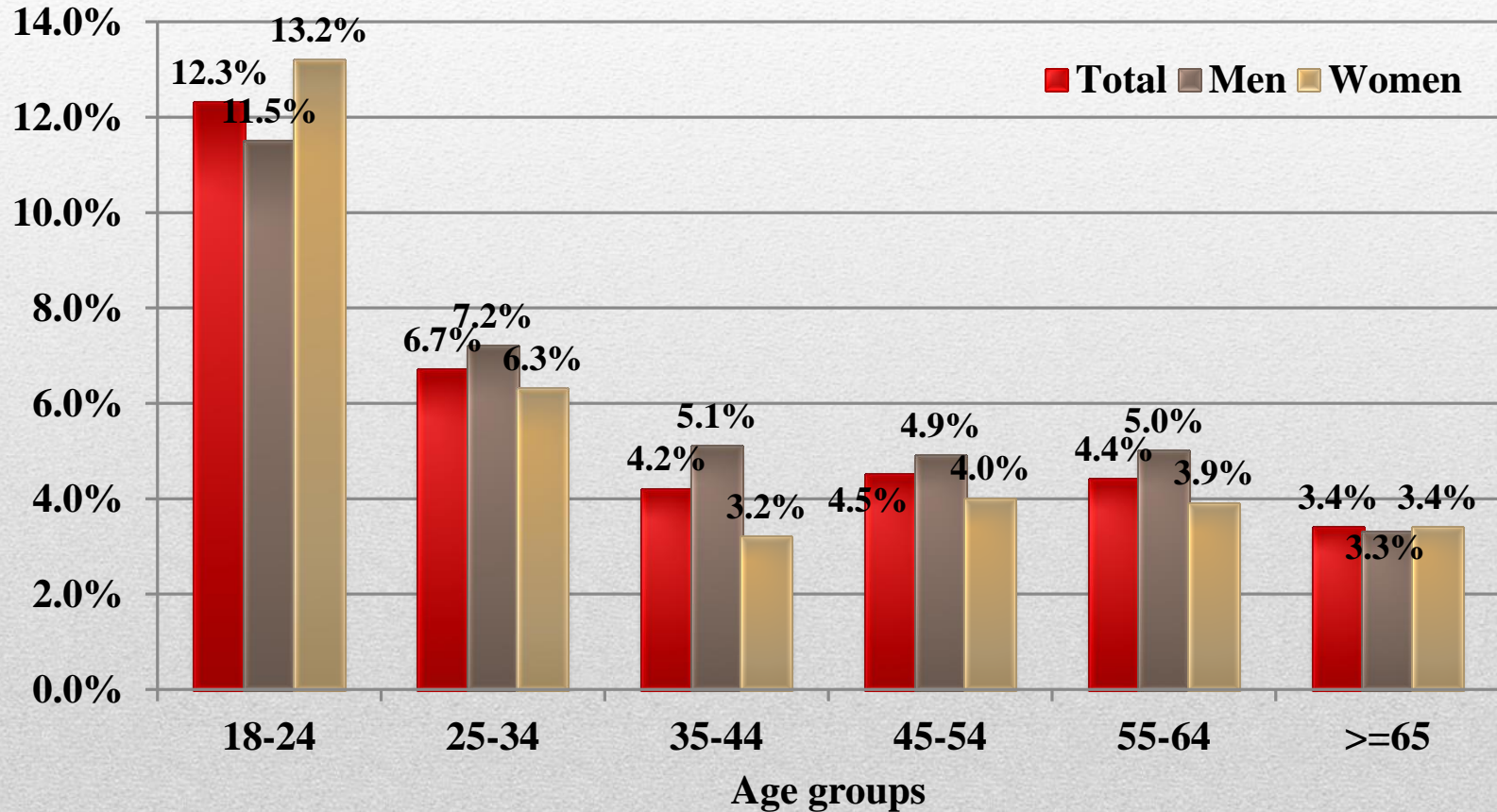
* Positive and differential diagnoses

Sleepiness At the Wheel (SAW) by age and gender

Legend: ■ Total ■ Men ■ Women

Age groups	Total	Men	Women
18-24	5.4%	7.6%	3.1%
25-34	7.0%	9.5%	4.3%
35-44	6.4%	8.8%	3.8%
45-54	7.5%	9.6%	5.4%
55-64	6.8%	8.8%	5.0%
>=65	6.3%	9.1%	4.0%

Men > women p<.001 for all age groups

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Traffic accidents by age and gender

Accidents higher in the 18-24 y.o. group p<.0001

Traffic accidents with or without SAW in the past year
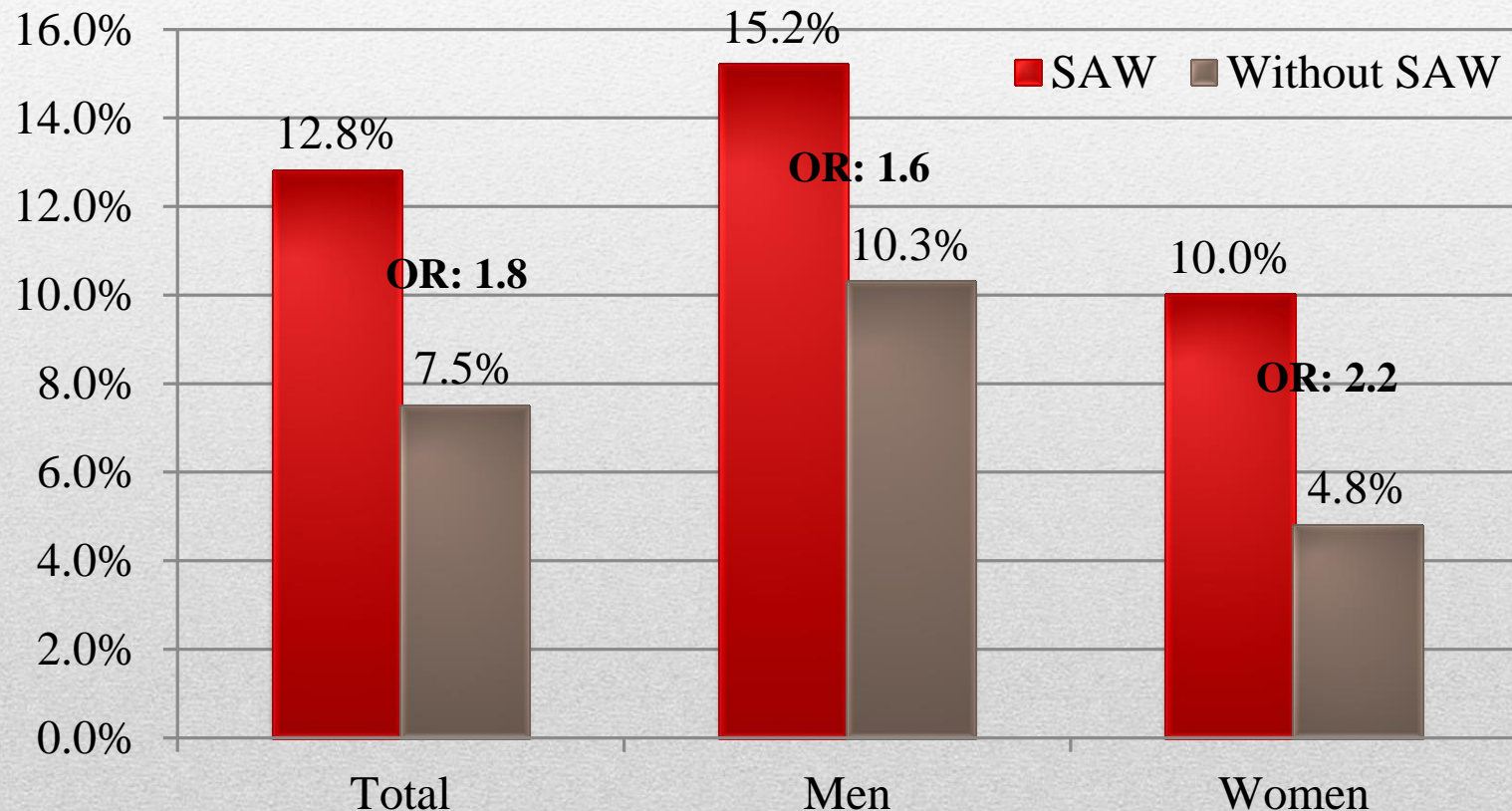
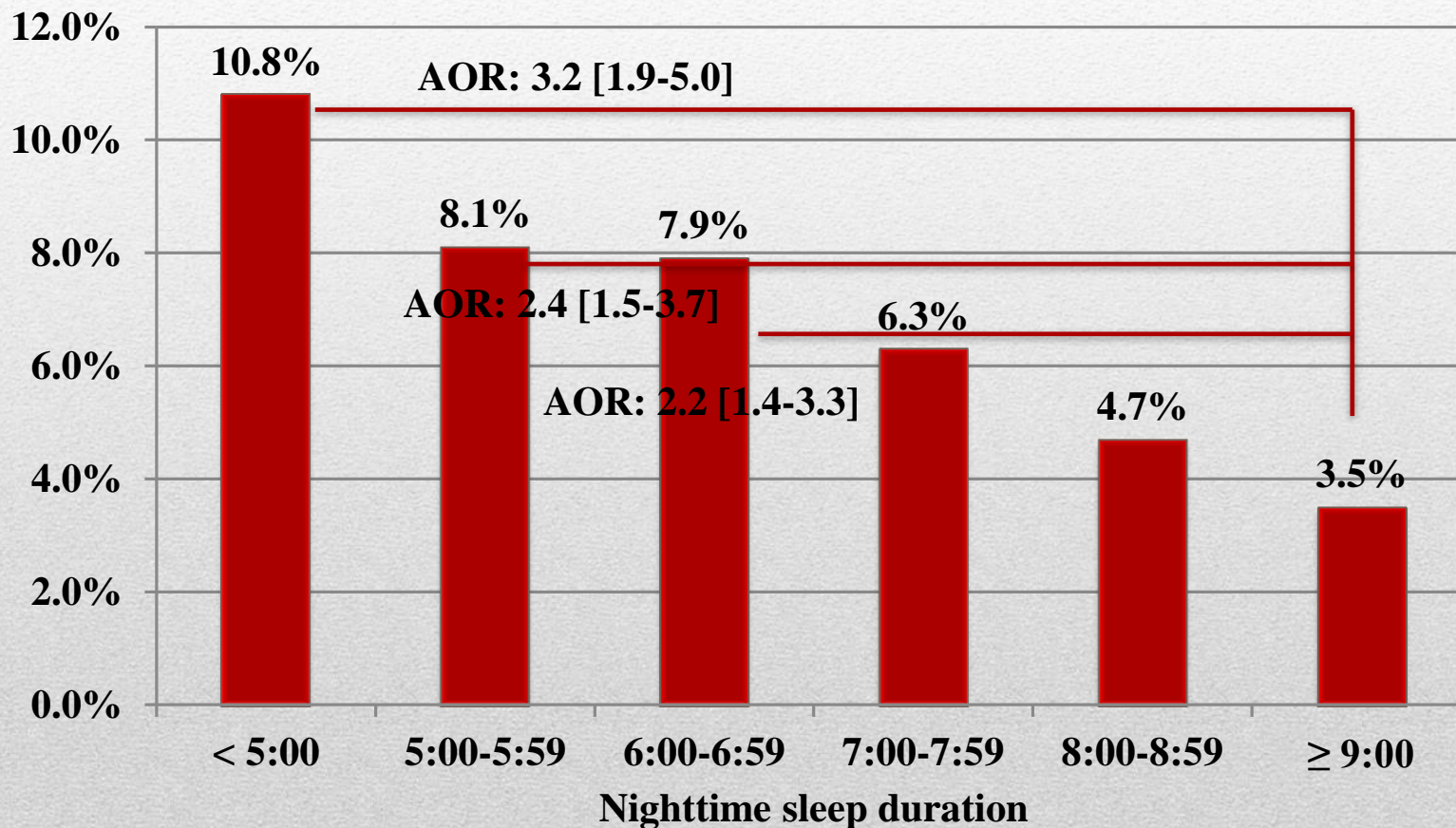% of car accidents SAW > without SAW p<0.0001 both in men and women
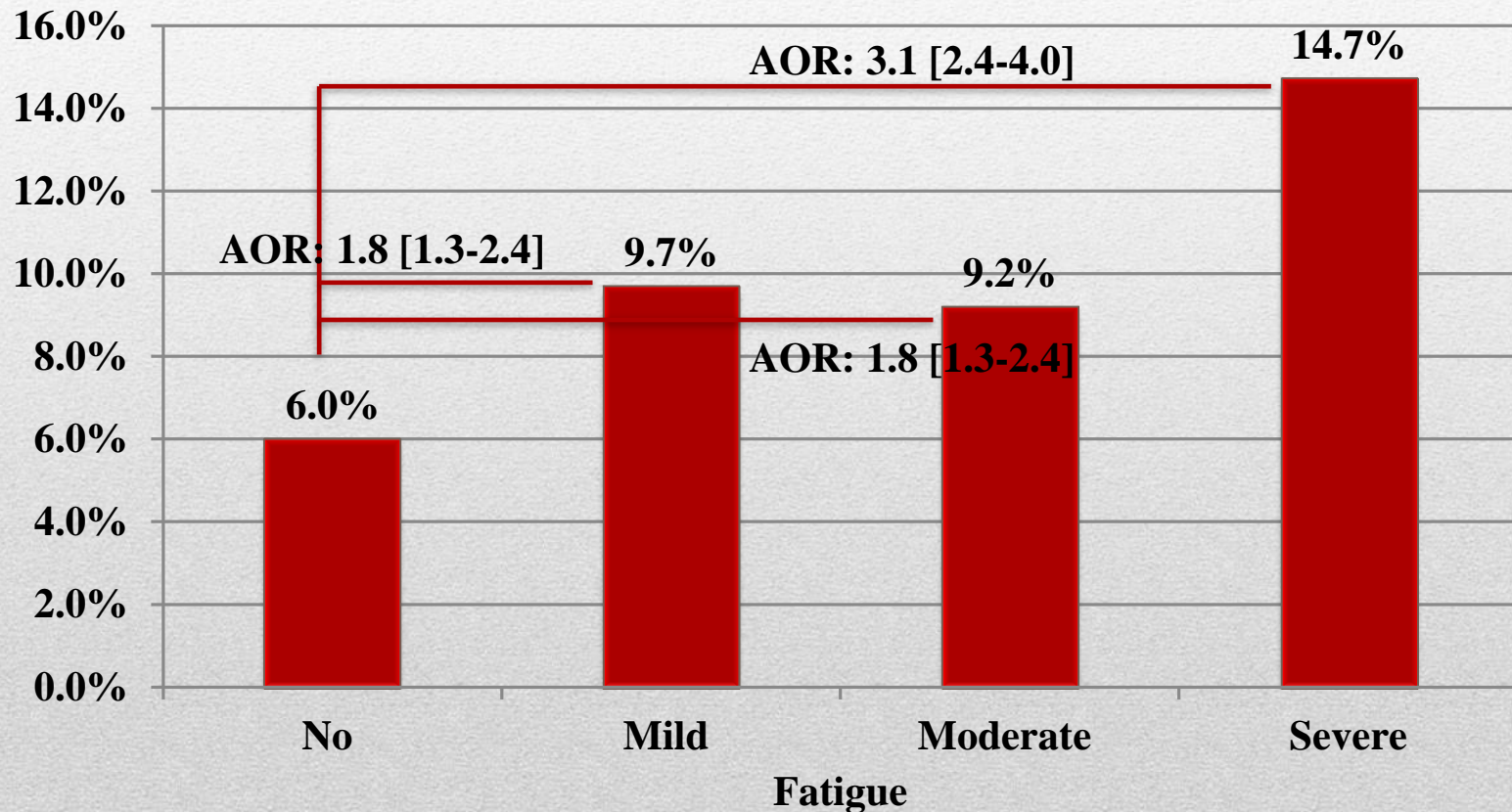
SAW by the time of the accident
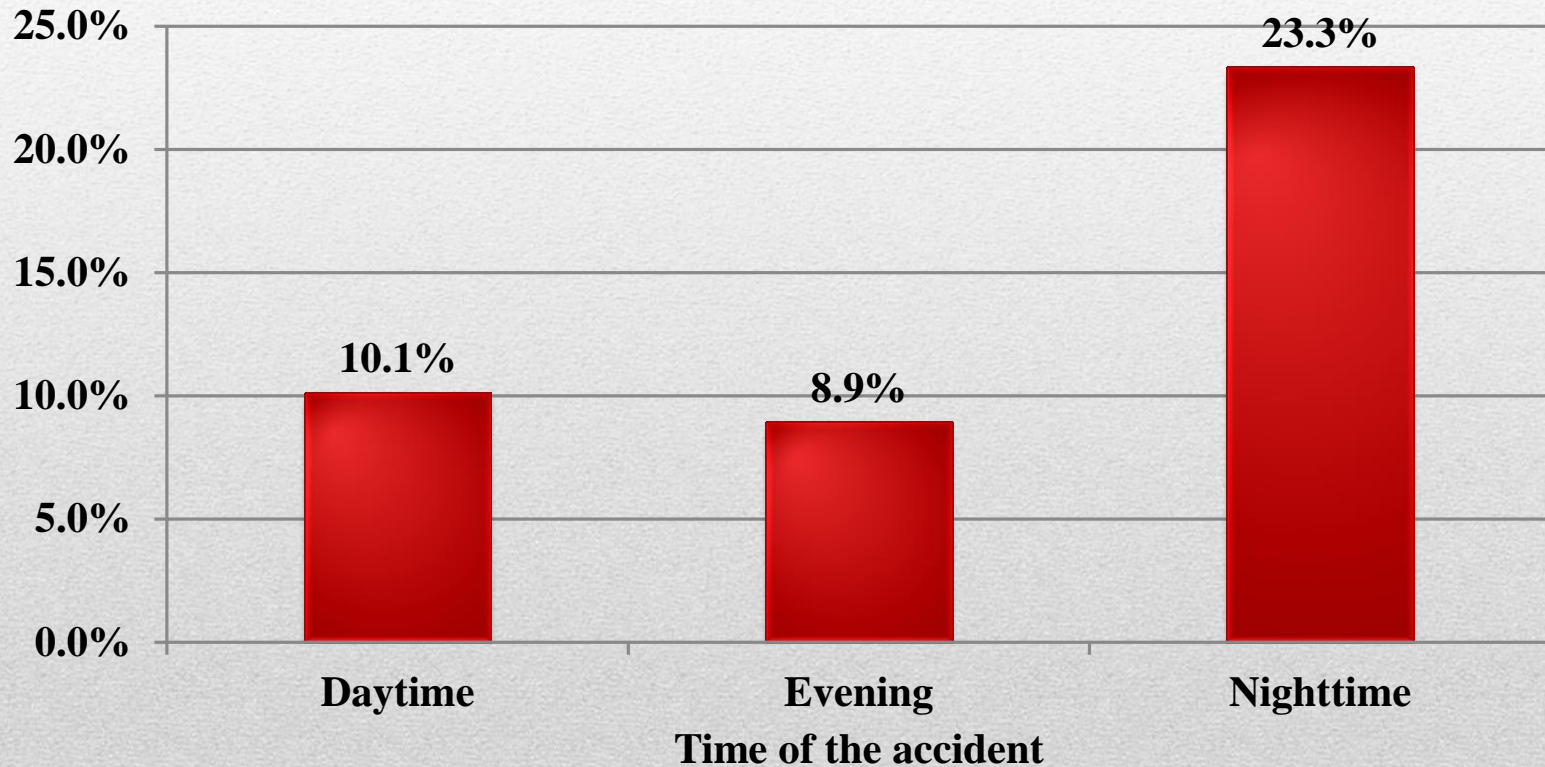
p < .0001 between nighttime and daytime and evening

SAW by nighttime sleep duration

AOR: Adjusted odd ratio for age and gender
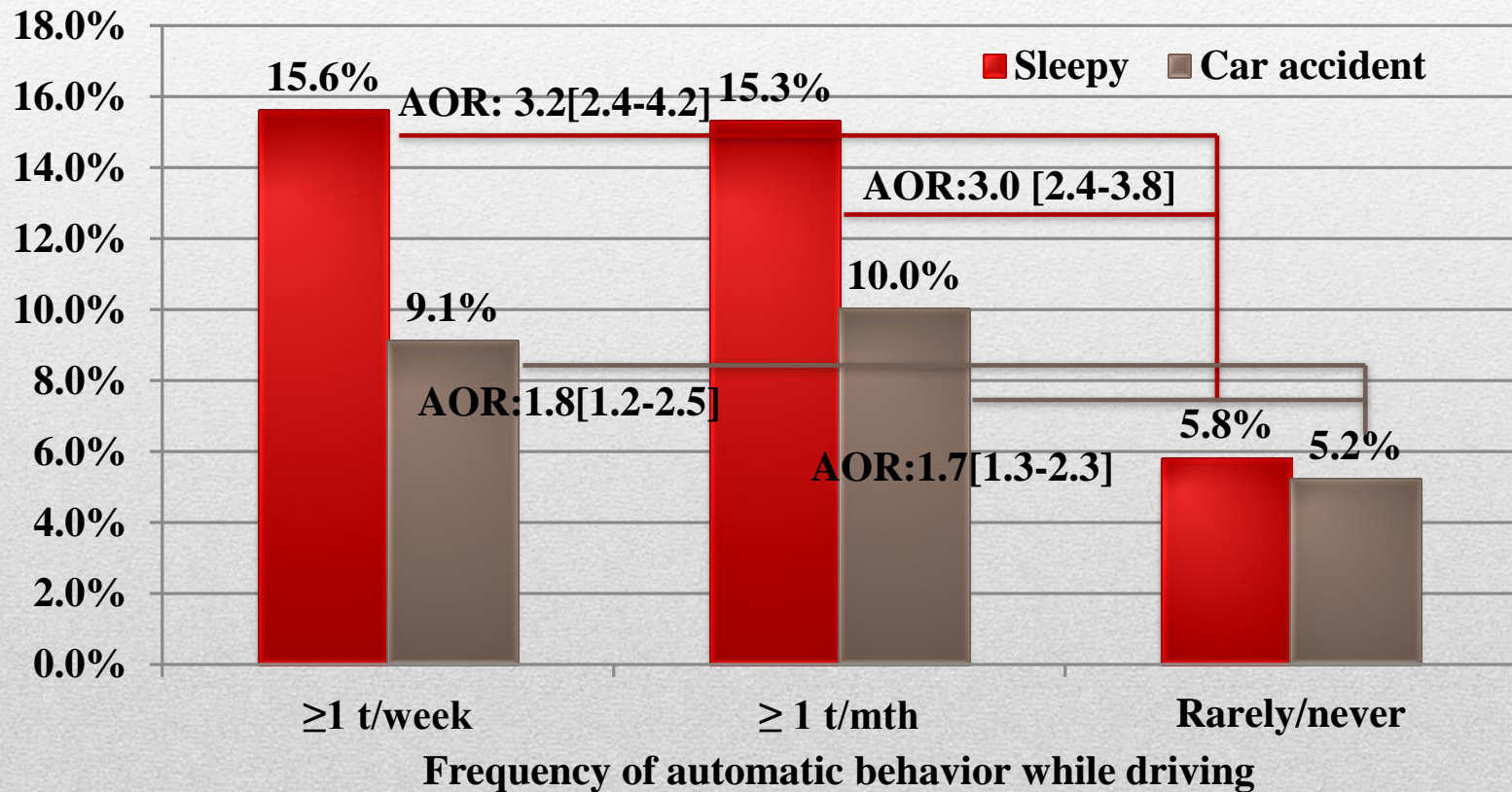Among people sleeping less than 5 hours …

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SAW by fatigue severity

AOR: Adjusted odd ratio for age and gender
Among people reporting no fatigue….

Prevalence of SAW and accidents by Automatic behaviors

Legend: ■ Sleepy ■ Car accident

- ≥1 t/week: Sleepy 15.6%, Car accident 9.1%
- ≥ 1 t/mth: Sleepy 15.3%, Car accident 10.0%
- Rarely/never: Sleepy 5.8%, Car accident 5.2%

AOR: 3.2[2.4-4.2]
AOR:3.0 [2.4-3.8]
AOR:1.8[1.2-2.5]
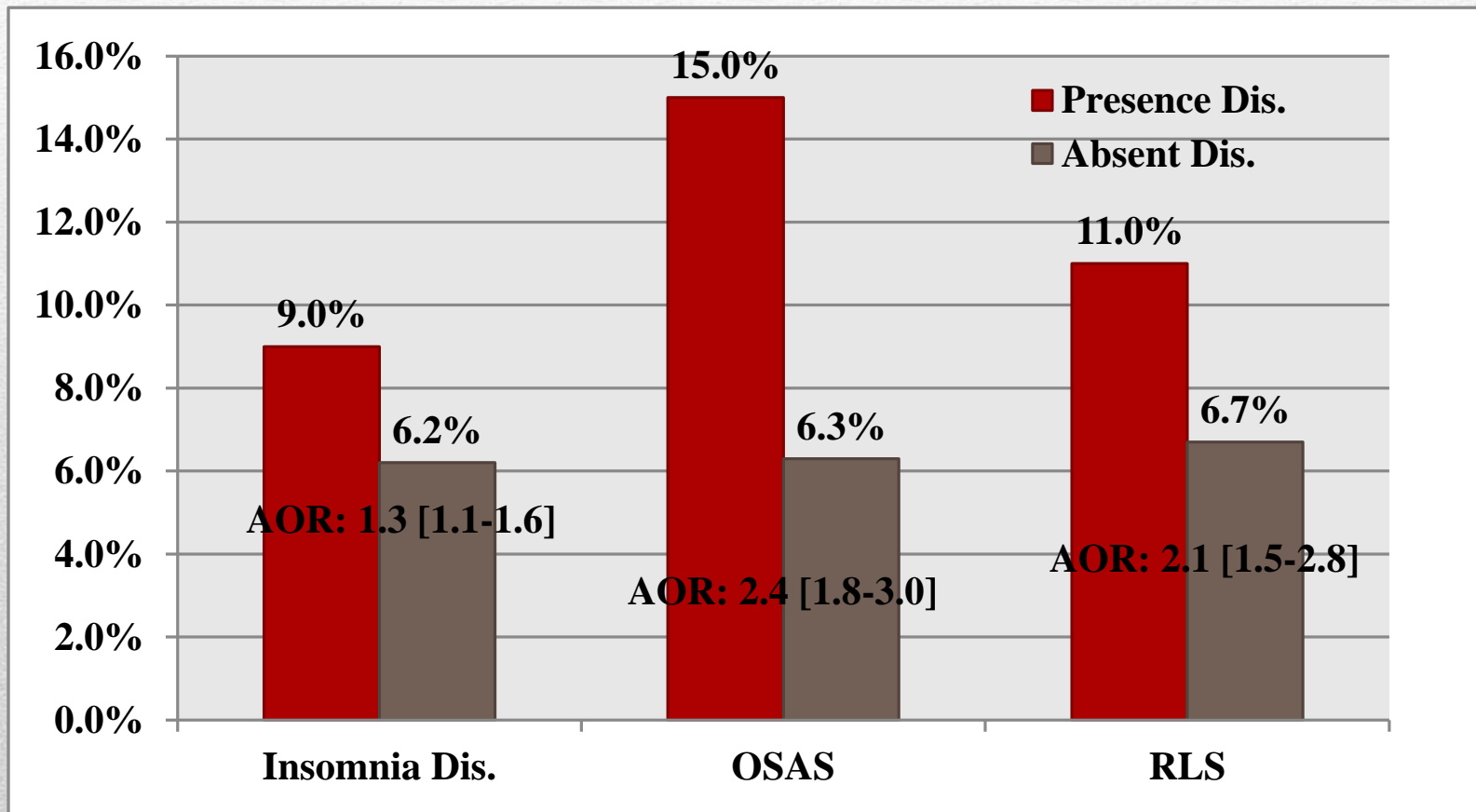AOR:1.7[1.3-2.3]

Frequency of automatic behavior while driving

AOR: Adjusted odd ratio for age and gender
Among individuals with automatic behaviors ≥ 1tweek 16.6% were sleepy at the wheel and 9.1% had a car accident

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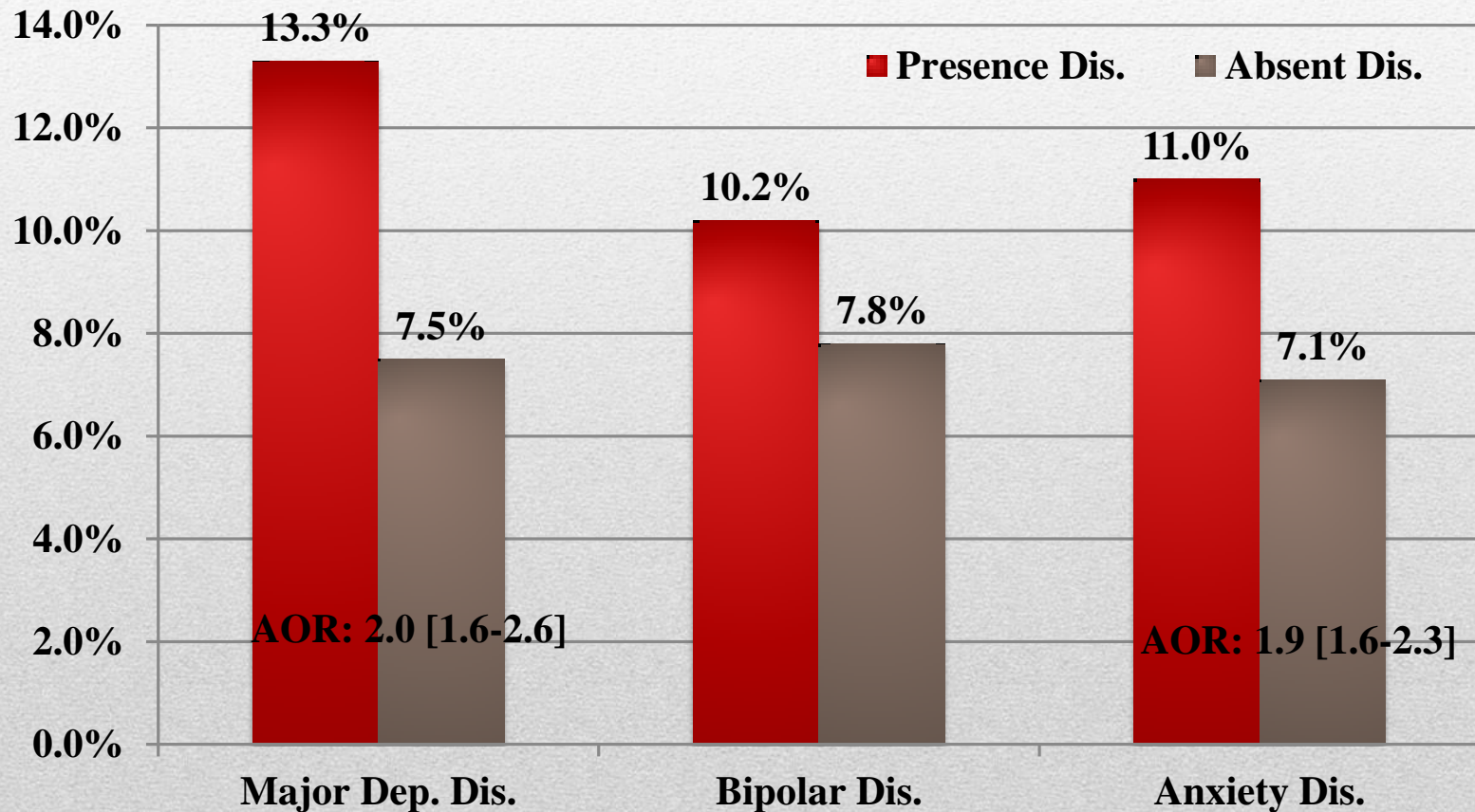# Prevalence of sleepiness at the wheel by sleep disorders

AOR: Adjusted odd ratio for age and gender
Among people with Insomnia disorder, 9 % are sleepy at the wheel in comparison, among people without Insomnia disorder, 6.2% are sleepy

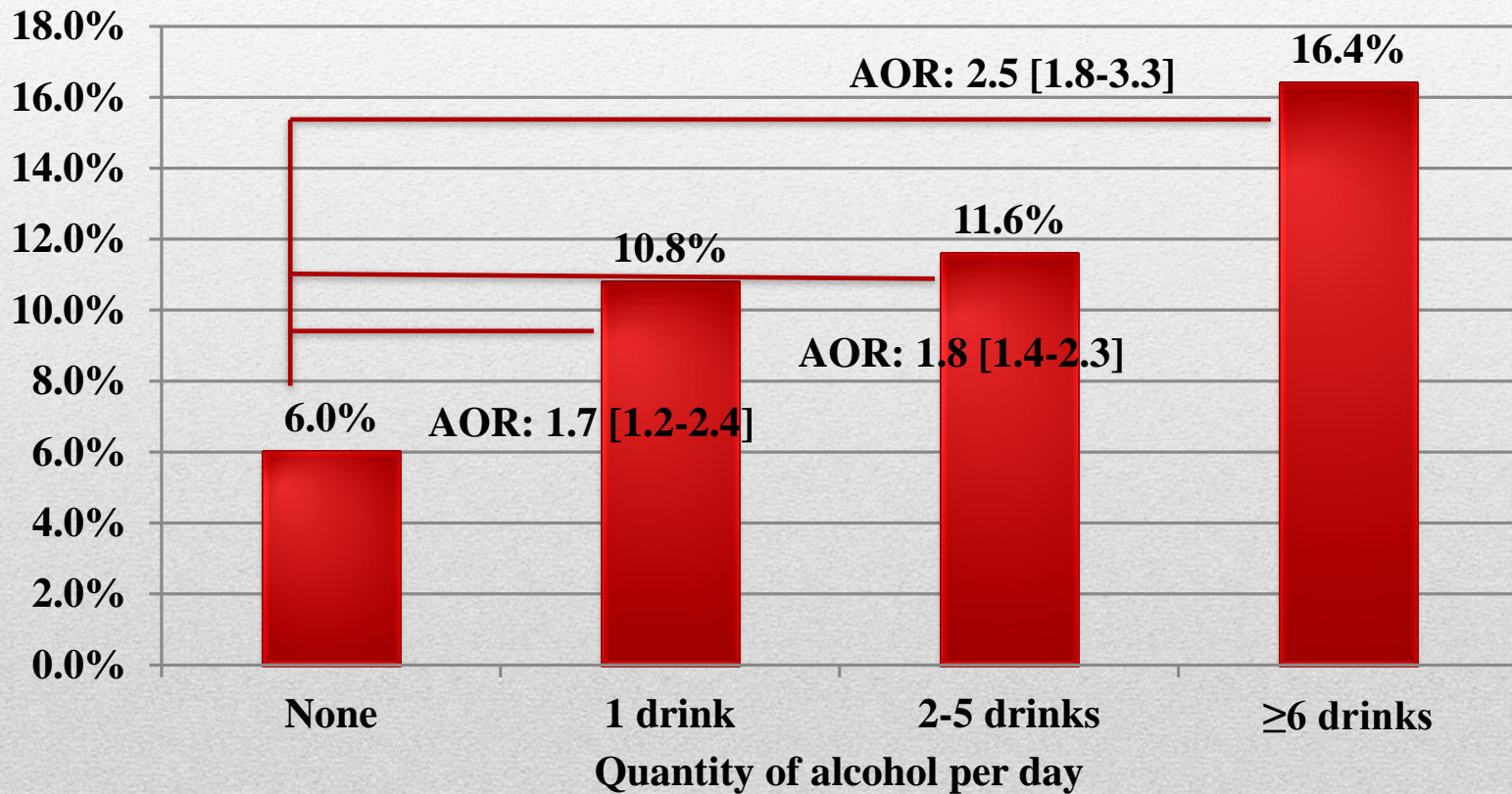# Prevalence of sleepiness at the wheel by mental disorders

AOR: Adjusted odd ratio for age and gender
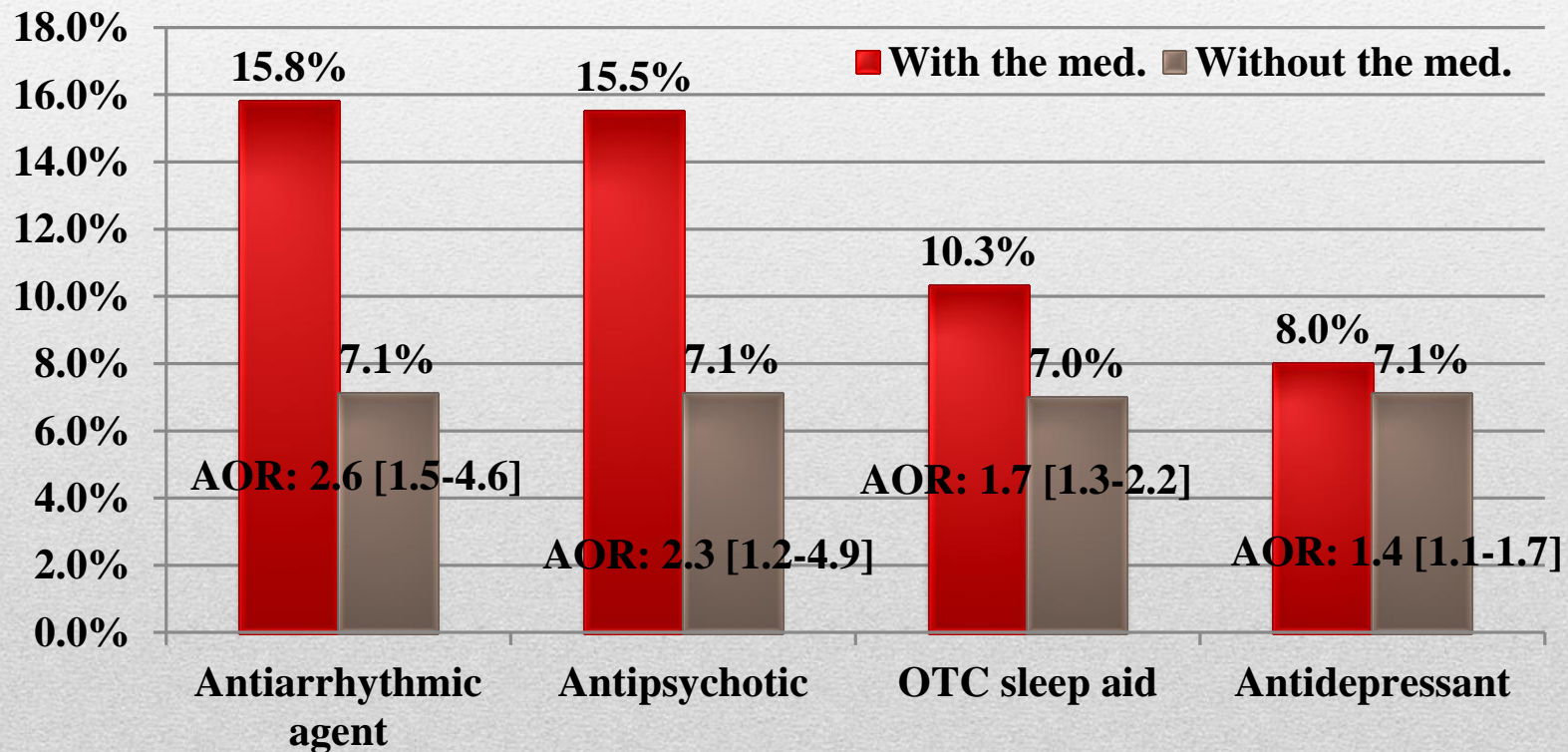Among people with MDD, 13.3 % are sleepy at the wheel in comparison, among people without MDD, 7.5% are sleepy

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Prevalence of sleepiness at the wheel by alcohol consumption

AOR: Adjusted odd ratio for age and gender
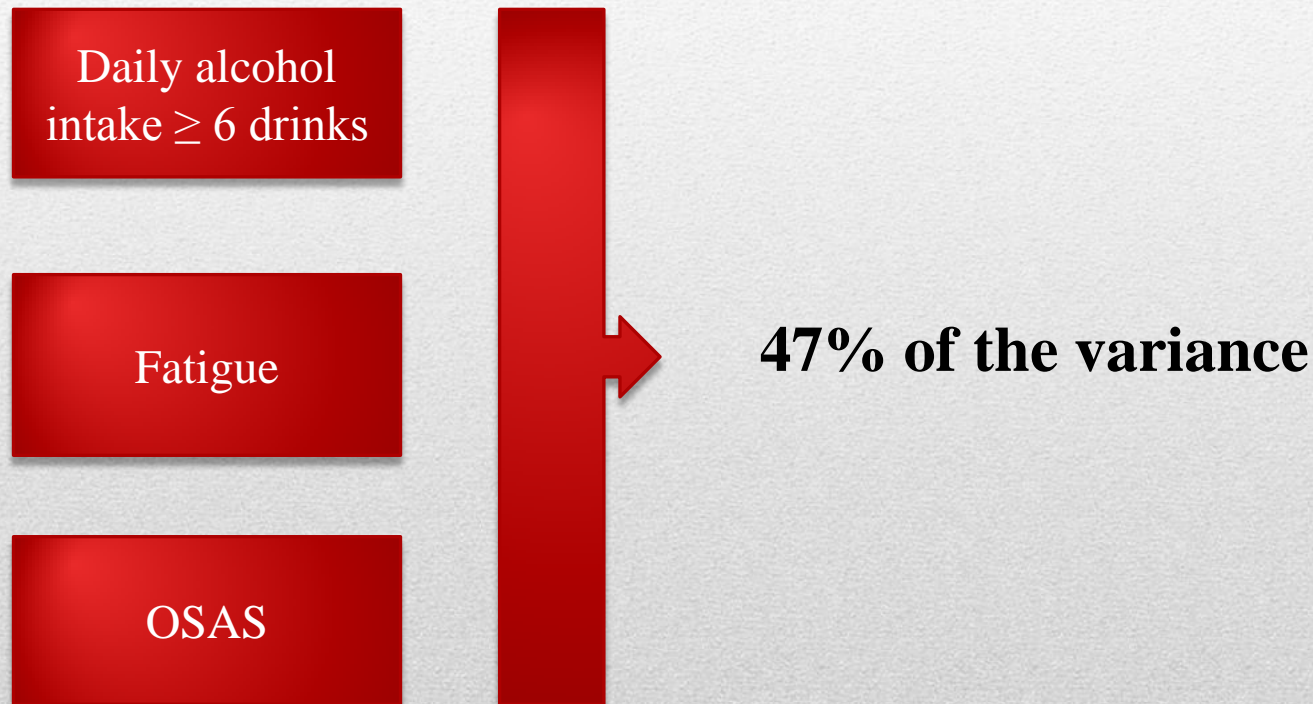
Prevalence of sleepiness at the wheel by medication

AOR: Adjusted odd ratio for age and gender
Among people using antiarrythmic, 15.8% are sleepy at the wheel in comparison, among people without antiarrythmic, 7.1% are sleepy

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Best predictors of sleepiness at wheel for men < 35 years

Daily alcohol intake ≥ 6 drinks

Fatigue

OSAS

47% of the variance

Best predictors of sleepiness at wheel for men ≥35 years

Multiple sleepiness episodes same day

Automatic behaviors at the wheel [≥ 1t/mo]

Sleep duration < 6 hrs/ night

Insomnia symptoms ≥ 3 months

46% of the variance

Best predictors of sleepiness at wheel for women < 35 years

Multiple sleepiness episodes same day
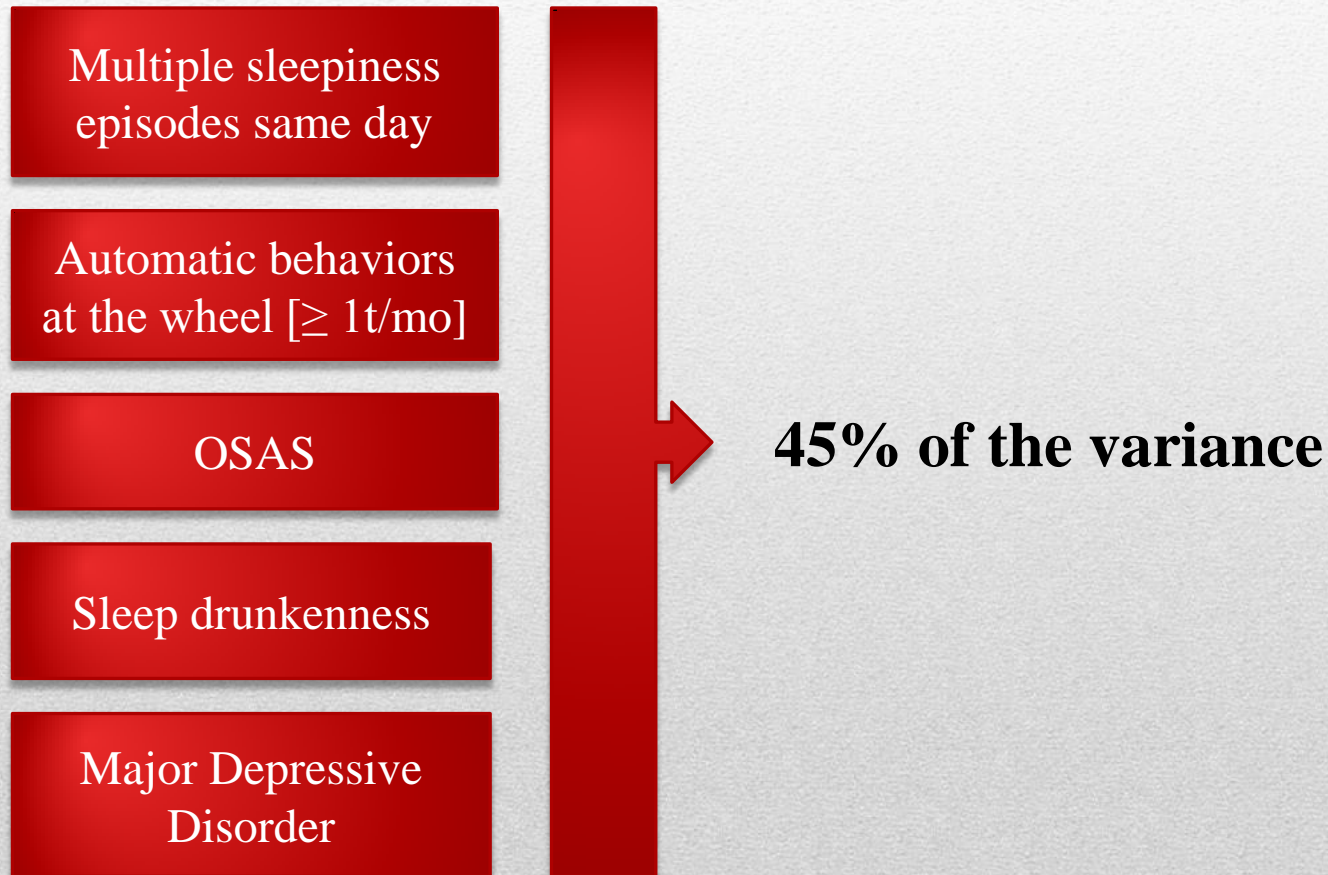
Daily alcohol intake ≥ 6 drinks

Automatic behaviors at the wheel [≥ 1t/mo]

OTC sleep aid

46% of the variance

Best predictors of sleepiness at wheel for women ≥ 35 years

Multiple sleepiness episodes same day

Automatic behaviors at the wheel [≥ 1t/mo]

OSAS

Sleep drunkenness

Major Depressive Disorder

45% of the variance

Best predictors of traffic accidents for men < 35 years

OSAS

Daily alcohol intake ≥ 6 drinks

Major Depressive Disorder

Insomnia symptoms ≥ 3 months

41.8% of the variance

Best predictors of traffic accidents for men ≥35 years

Automatic behaviors at the wheel [≥ 1t/mo]

Daily alcohol intake ≥ 6 drinks

Sleep drunkenness

Asthma & Allergies

32.2% of the variance

Best predictors of traffic accidents for women <35 years

Asthma & Allergies

Sleep drunkenness

OTC Sleep aid

33.6% of the variance

Best predictors of traffic accidents for women ≥35 years

Sleepiness at the wheel

Automatic behaviors at the wheel [≥ 1t/mo]

26.6% of the variance
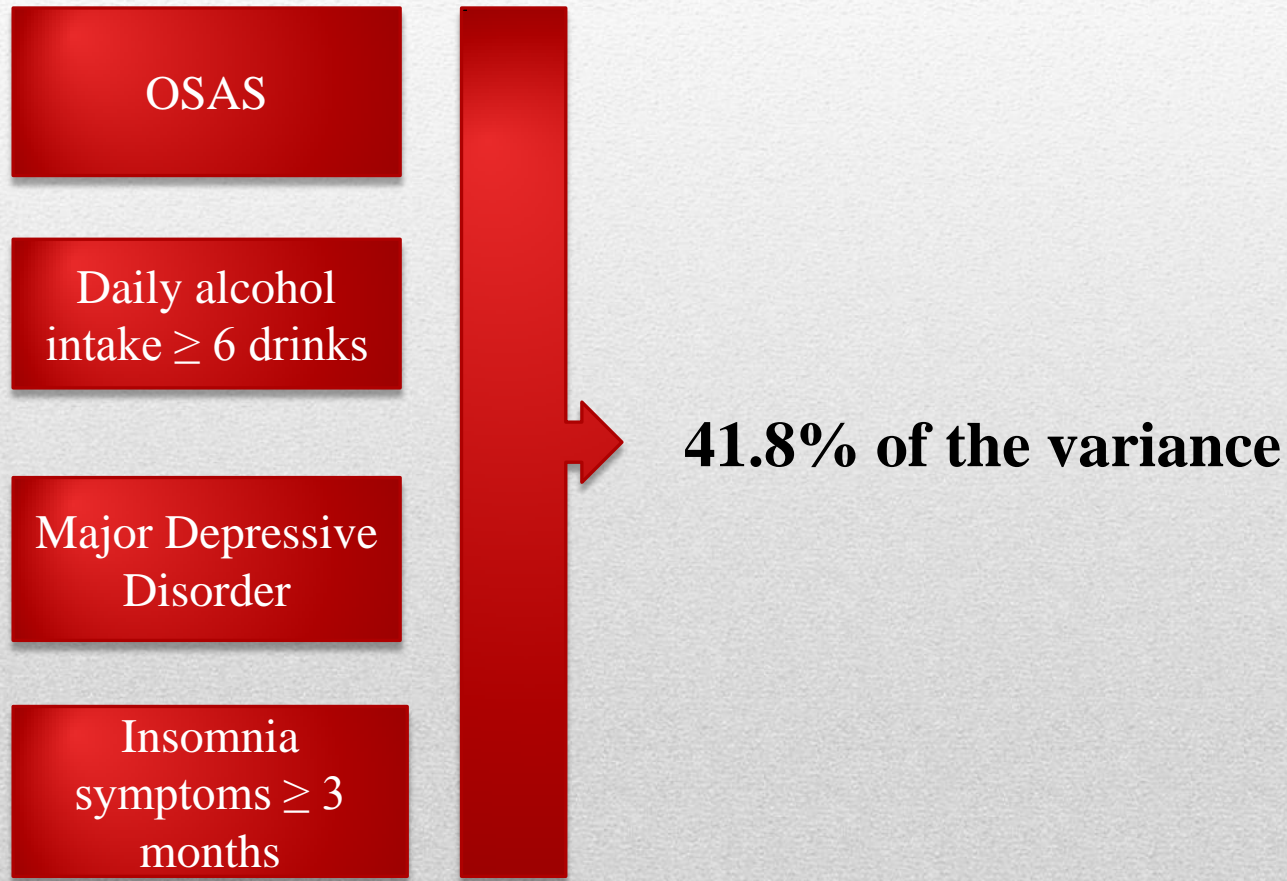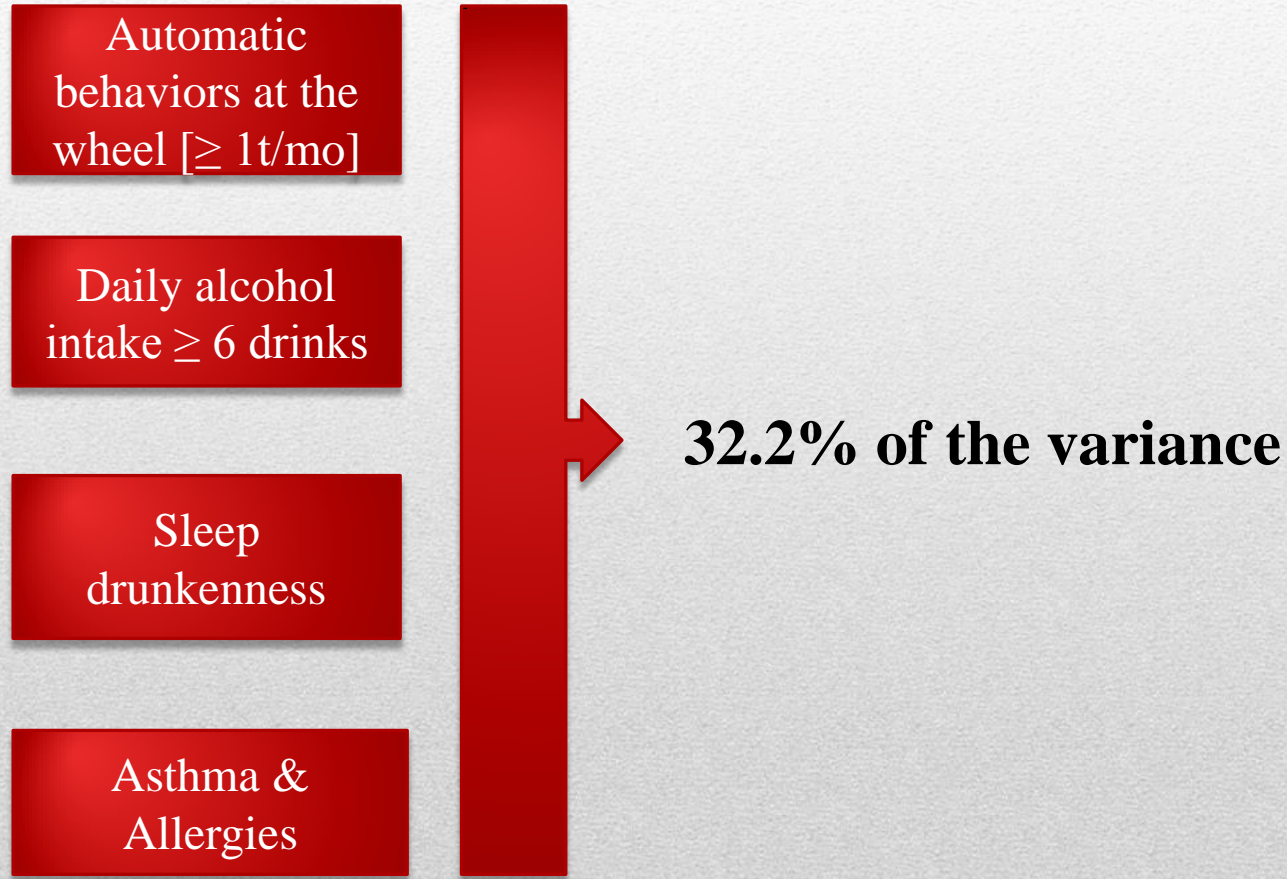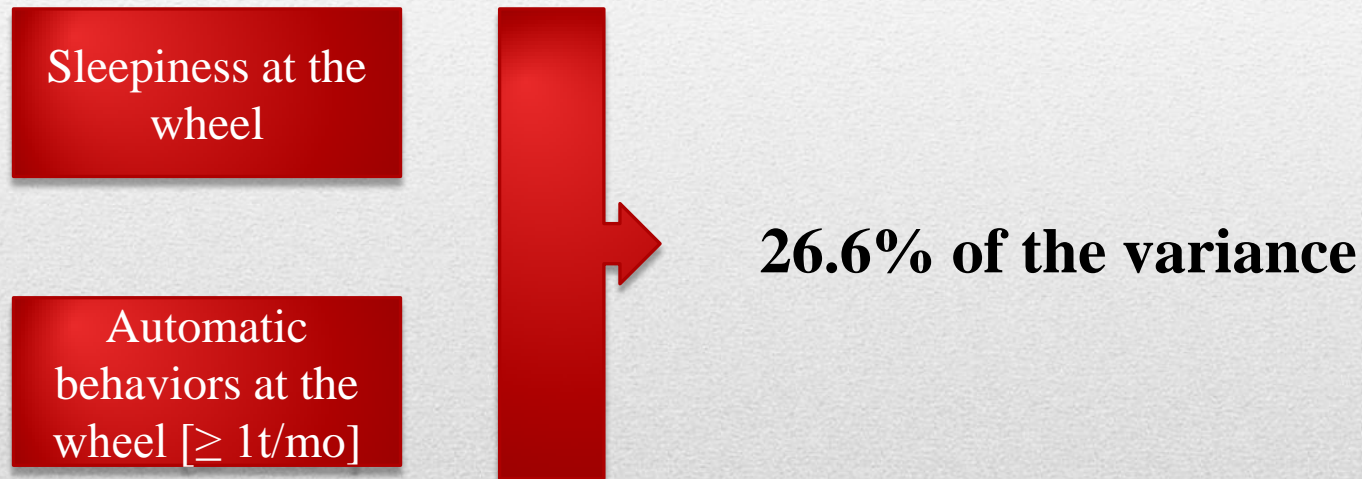
Conclusions

- Sleepiness while driving is relatively frequent affecting 9% of men and 4.3% of women representing 13.4M of American drivers*

- Sleepy individuals at the wheel have nearly 2 times more chances to be involved in a traffic accident in the past year

- Factors associated with sleepiness at the wheel are numerous: sleep deprivation, fatigue, insomnia, OSAS, depression, anxiety disorders, alcohol and medications (including OTC)

* Based on 2013 Census data: 242,470,587 inhabitants aged ≥ 18 y.o.
84% are drivers= 203,675,292 of American drivers
6.6% of sleepiness at wheel: 203,675,292 * 0.066 = 13,442,569 sleepy drivers