



Education and Prevention Subcommittee Mandated Report to the Commission November 14, 2017



“In order to establish a common baseline understanding of the most credible data regarding health endpoints of marijuana use and safety impacts of legalization...the subcommittees shall assess high quality primary research, including evidence-based Vermont data to the extent it is available for the following groups of health and safety endpoints and report to the Commission.”

Levels of Evidence

Conclusive	=	Randomized controlled trials
Substantial	=	Strong evidence to support a statistical association; good quality studies
Moderate	=	Some evidence; good to fair quality studies
Limited	=	Weak evidence; fair quality studies or mixed findings
Insufficient	=	Mixed findings or minimal study

What Reduces the Level of Certainty in a Study's Conclusions?

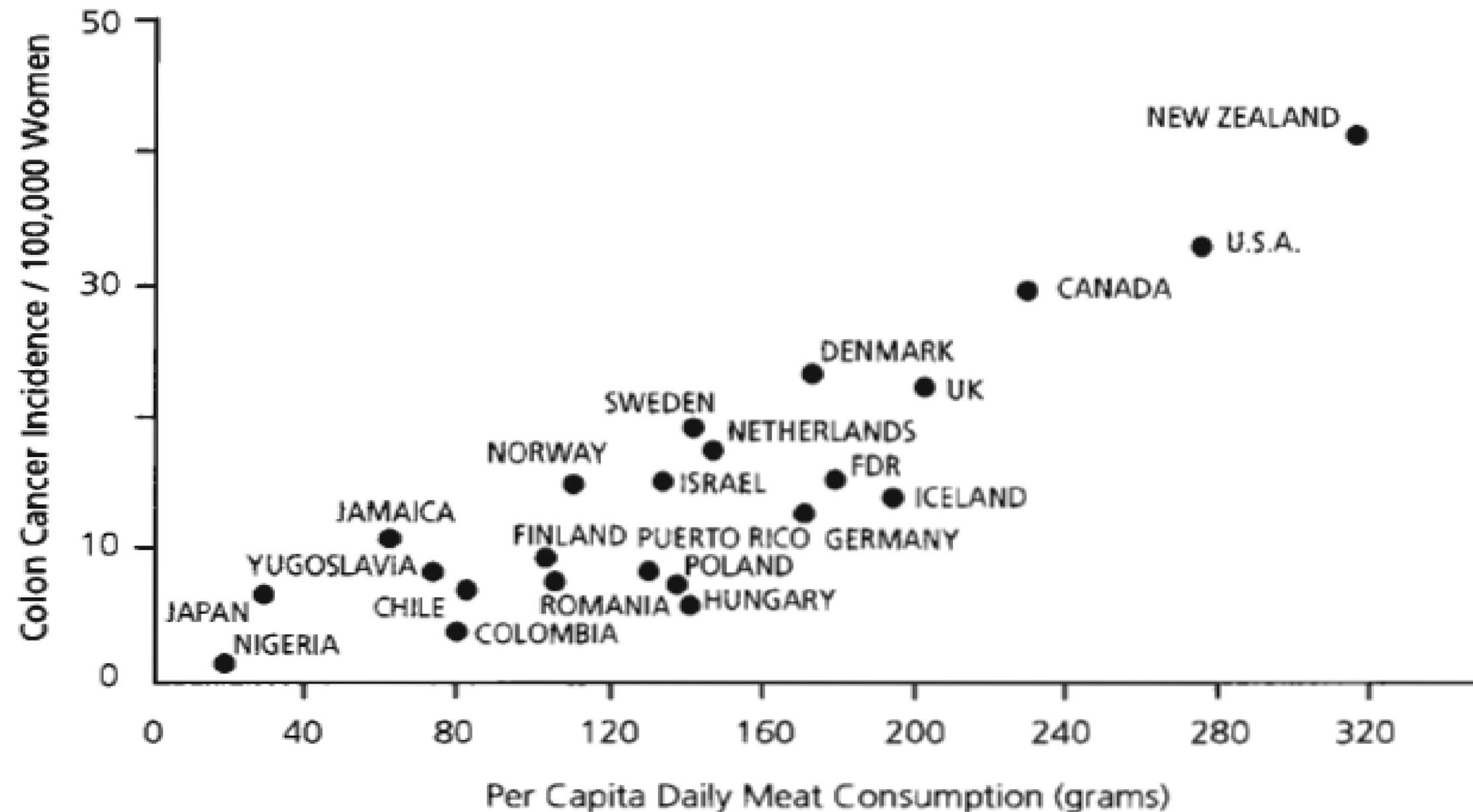
Chance: Random variation from sample to sample.

Bias: Systematic error in the way individuals are selected into the study or the way in which information is collected or reported.

Confounding: An observed association between an exposure and disease could be due, totally or in part, to the effect of other baseline differences between groups that were unrecognized or uncontrolled.

Ecological Fallacy

CHART 8.4: FEMALE COLON CANCER INCIDENCE AND DAILY MEAT CONSUMPTION



Evidence that an Association is Cause and Effect

Criterion

Comments

Temporality

Cause precedes effect

Strength

Large relative risk

Dose-Response

Large exposure to cause associated with high rates of disease

Reversibility

Reduction in exposure associated with lower rates of disease

Consistency

Repeatedly observed by different persons, in different places, circumstances and time

Committee Process

- Materials Used:
 - ▣ VDH Health Impact Assessment 2016 and update 2017
 - ▣ National Academy of Medicine Health Effects of Cannabis and Cannabinoids
 - ▣ Extensive medical literature review
 - ▣ Committee Discussions and review of report

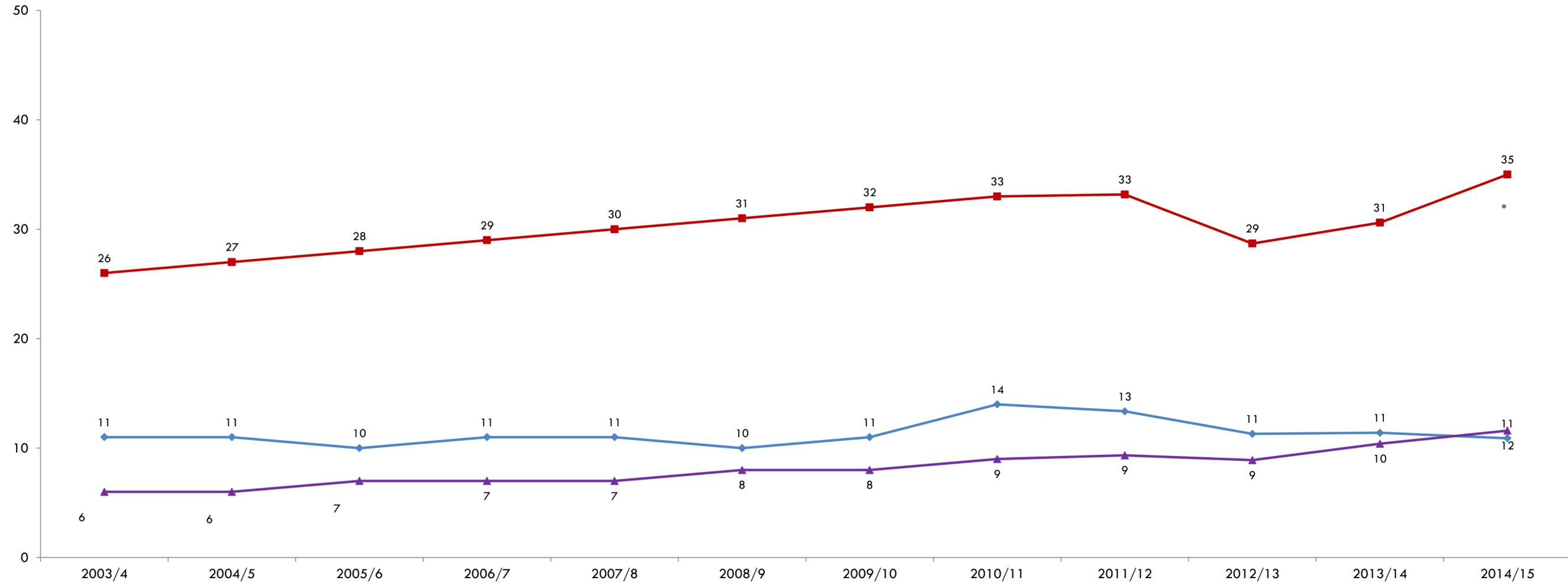


Summary of Findings

National Survey on Drug Use and Health

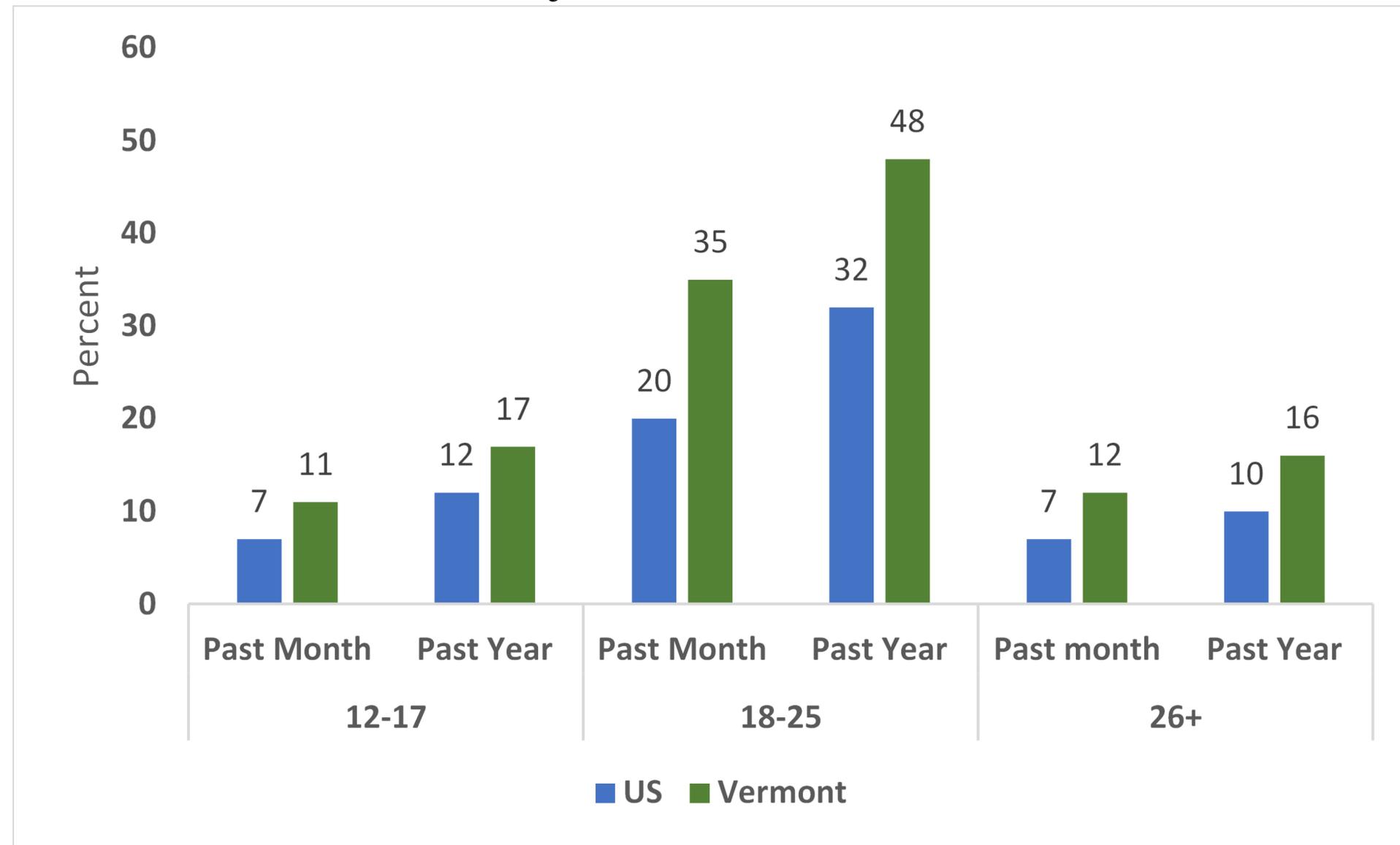
Percent of Vermont population reporting past 30 day marijuana use by age in years.

12-17 18-25 26+



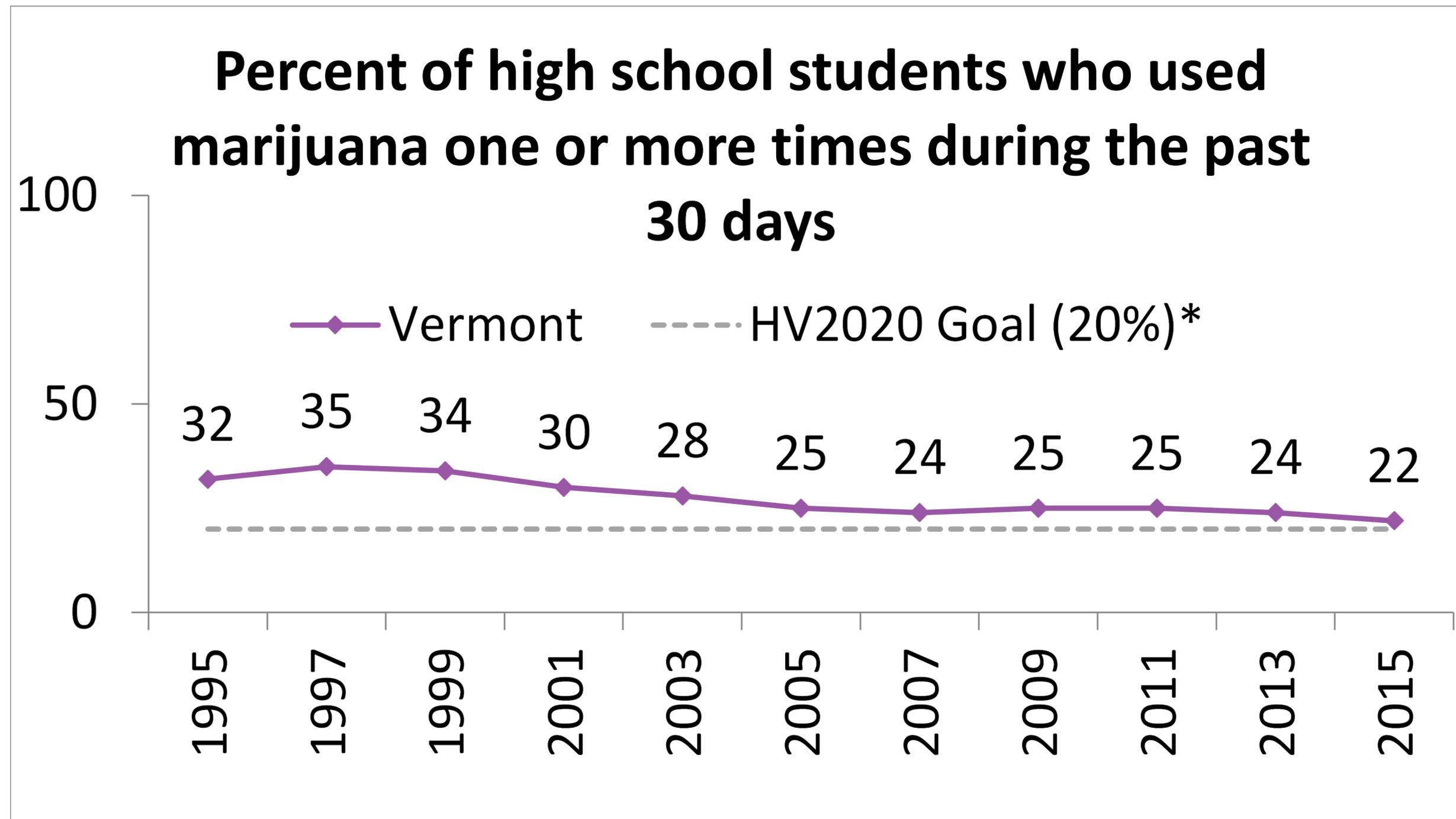
Past Month and Past Year Marijuana Use in the US and VT

Past Month and Past Year Marijuana Use in the US and Vermont (2014/15)*

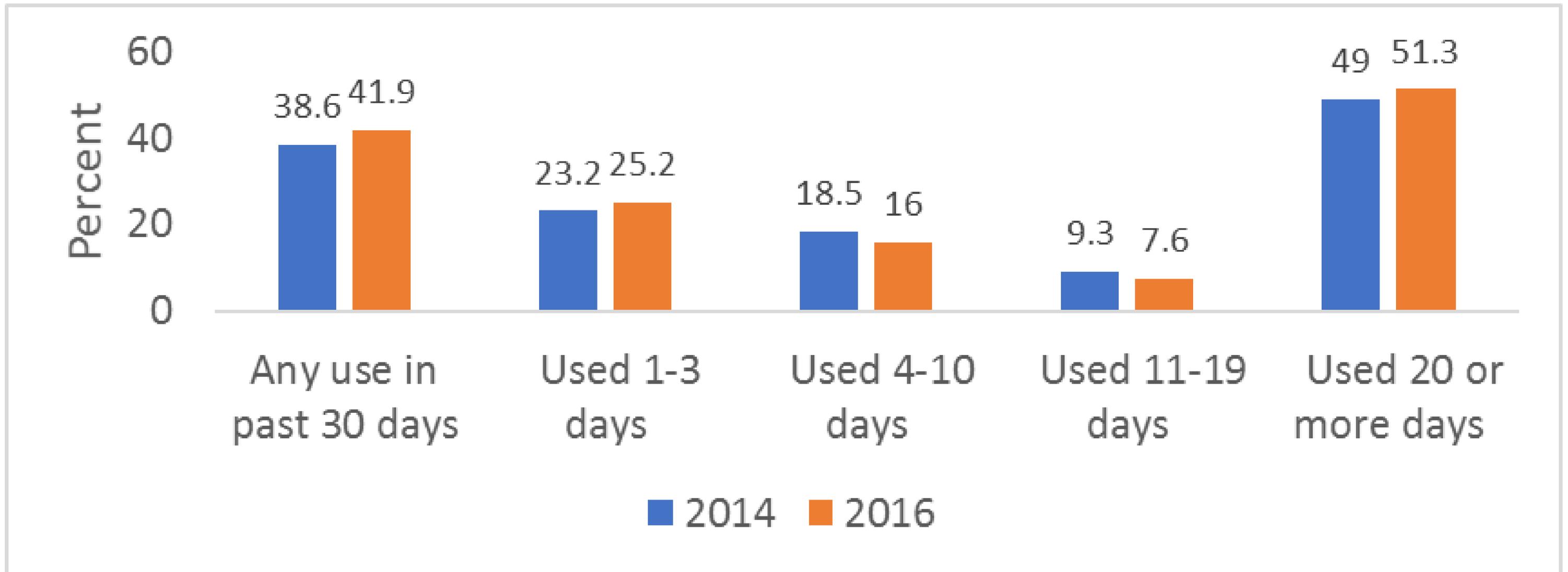


*All differences between US and Vermont are statistically significant for all age groups

Youth Risk Behavior Survey (YRBS)



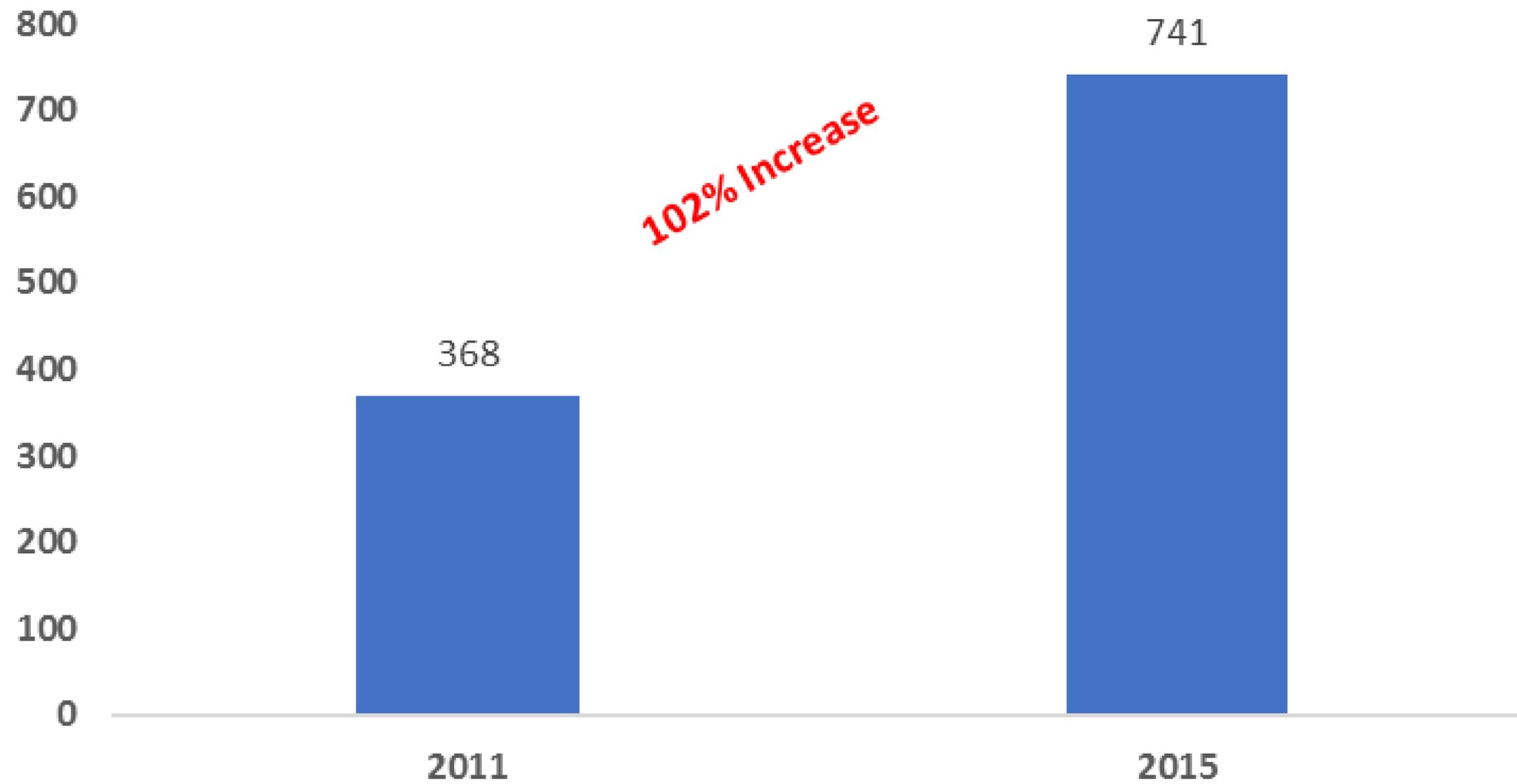
Young Adult Survey



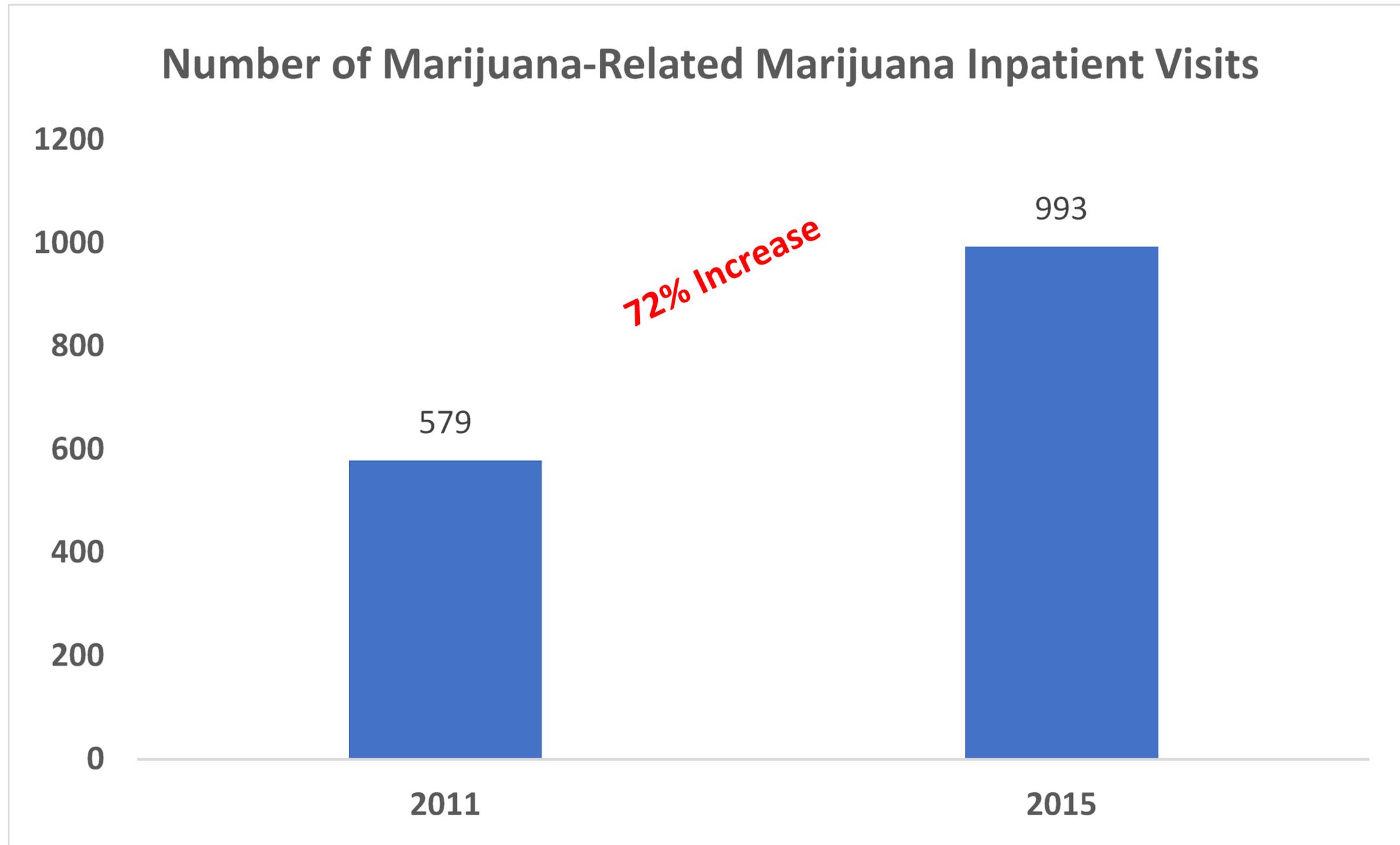
Injury and Death

- Limited evidence to support or refute a statistical association between cannabis use and:
 - ▣ All cause mortality
 - ▣ Occupational injuries
 - ▣ Deaths due to cannabis overdose
- Substantial evidence for cannabis use and:
 - ▣ Cannabinoid Hyperemesis Syndrome
 - ▣ Emergency Department Use
- Moderate evidence for cannabis use and:
 - ▣ Fatal car crashes

Number of Marijuana-Related ED Visits



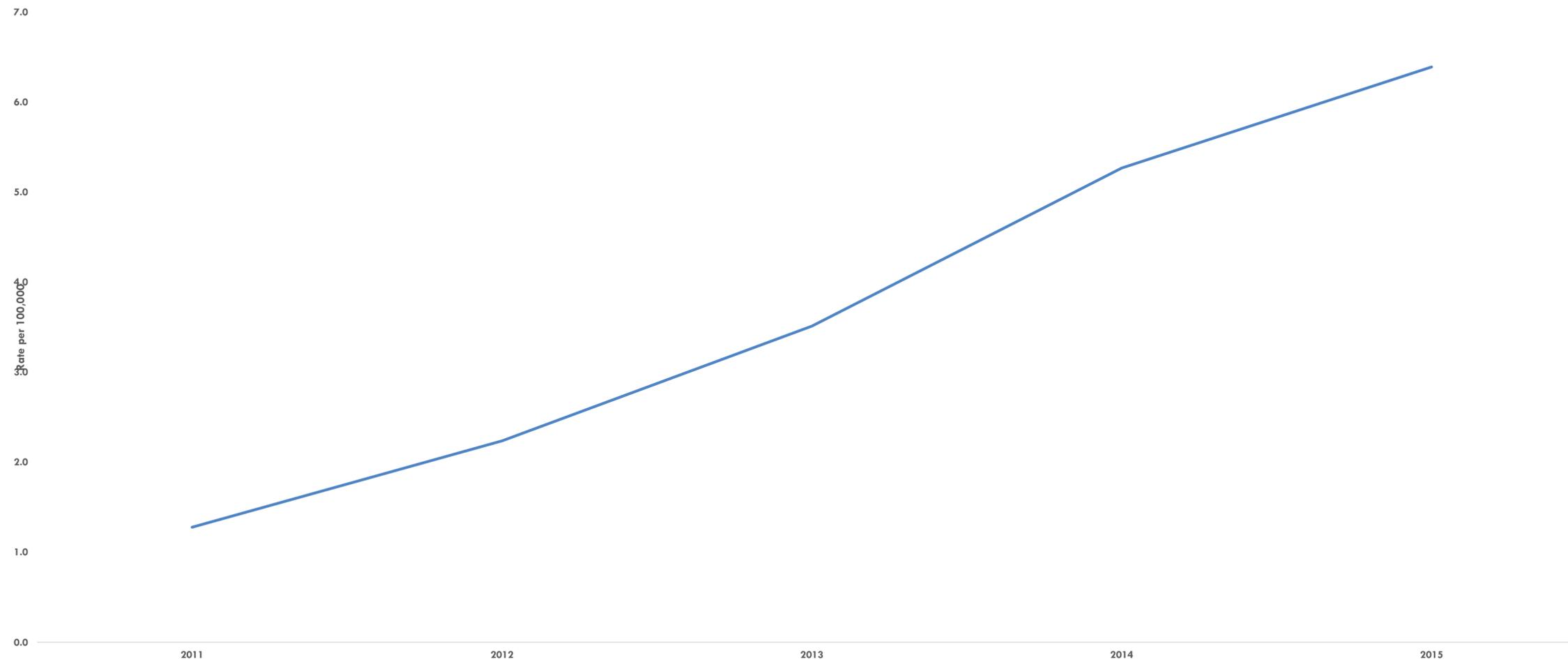
Vermont marijuana-related hospital admissions



Vermont Department of Health

Cannabis Hyperemesis Syndrome

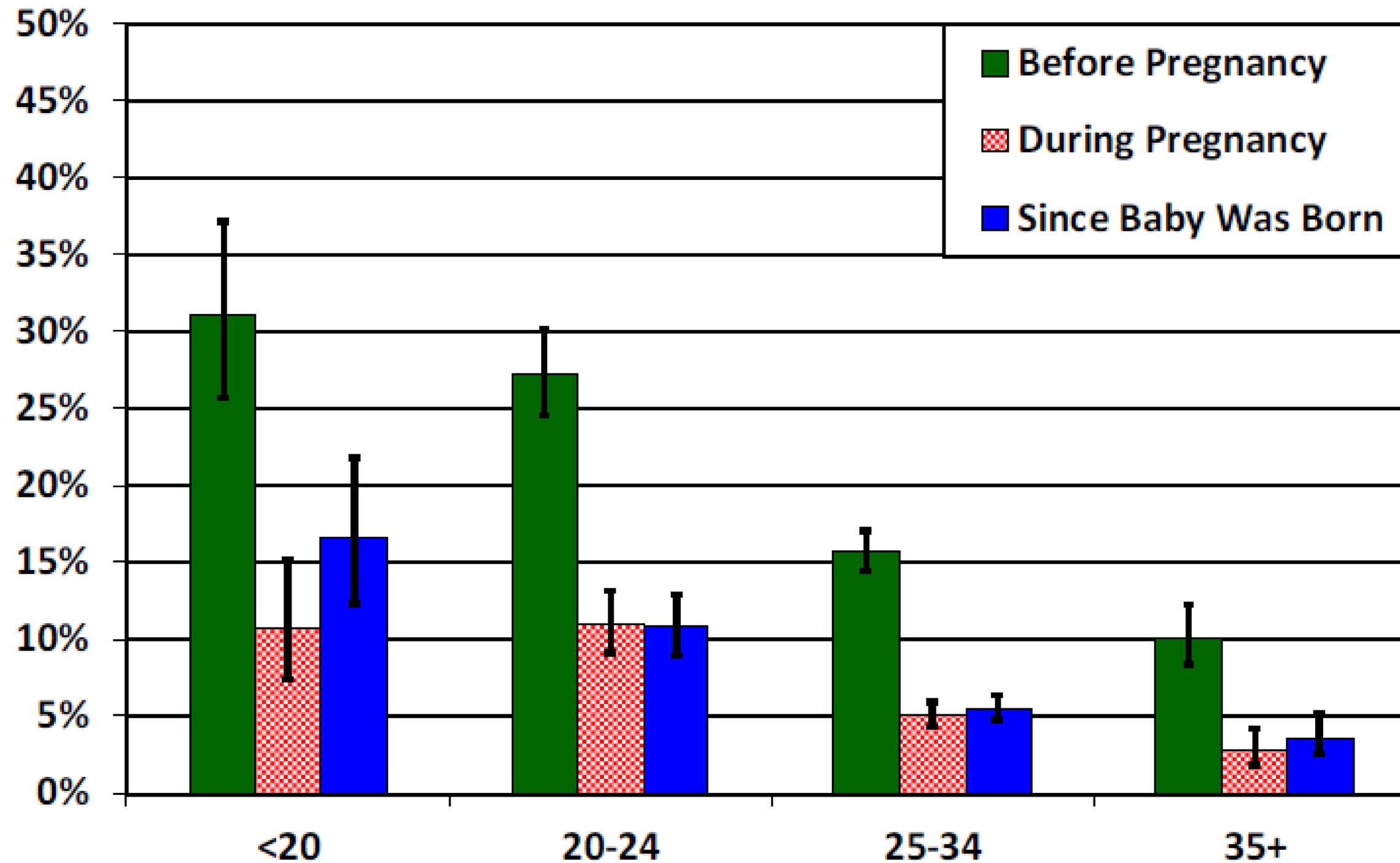
Change in the rate per 100,000 of individuals presenting to VT Emergency Departments



Prenatal, Perinatal Exposure to Marijuana

- Moderate evidence for concerning increasing use among pregnant women.
- Insufficient evidence for association between maternal cannabis smoking and long-term offspring outcomes (cognitive function, subsequent substance use).

Marijuana Use Before, During & After Pregnancy by Age Vermont Births 2009-2013



Psychosocial Consequences

- Moderate evidence for cannabis use and:
 - ▣ Impaired academic achievement
 - ▣ Lower income and unemployment

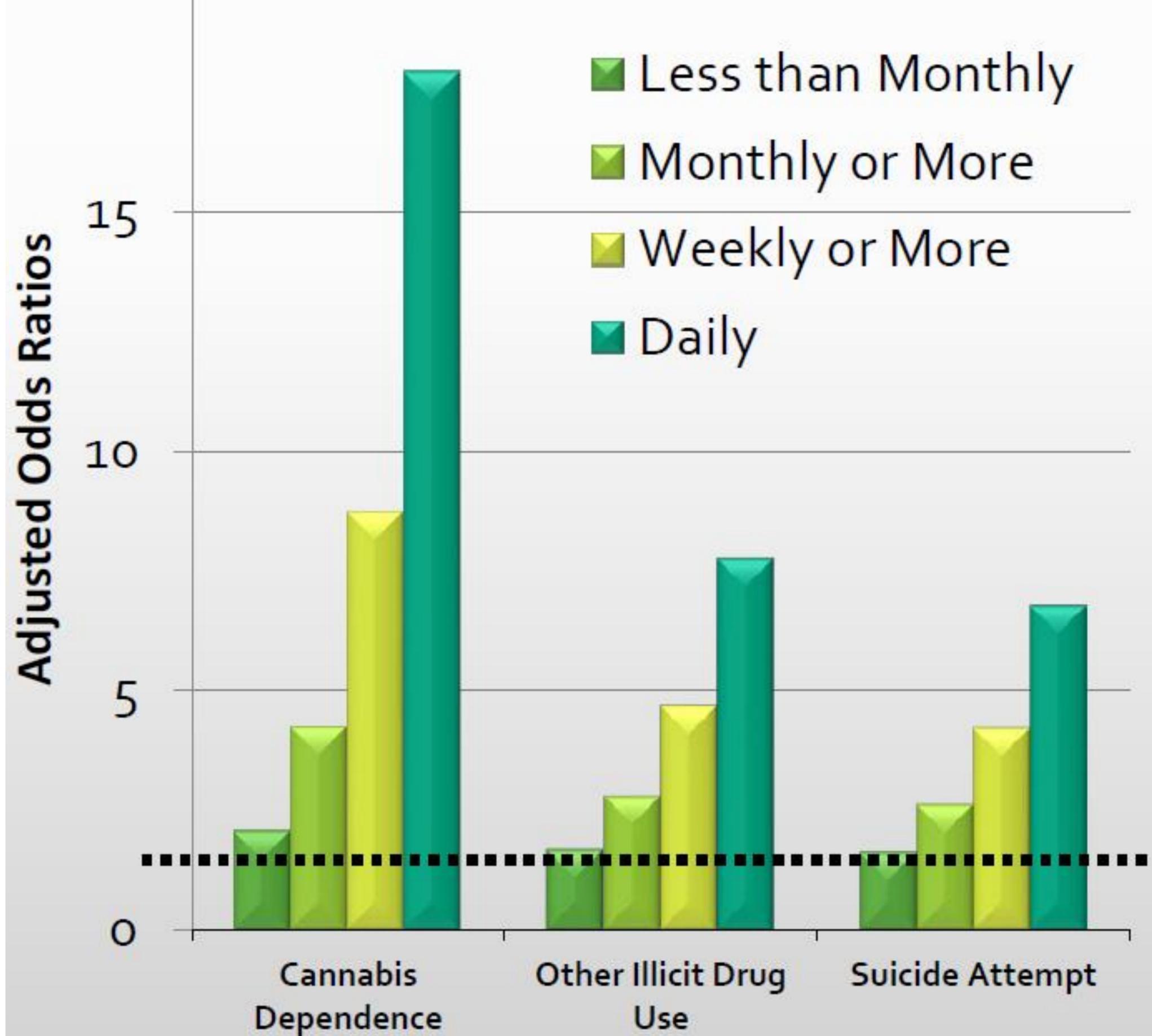
Mental Health

- Substantial evidence for cannabis use and:
 - ▣ Development of acute psychosis and chronic psychotic illness such as schizophrenia.
 - ▣ Insufficient evidence for development of PTSD or bipolar disorder.

Problem Marijuana Use

- Substantial evidence for cannabis use frequency and development of cannabis use disorder, which is then subsequently associated with diagnosis of other psychiatric disorders.

Frequency of Use and Risk of Cannabis Dependence, Other Drug Use, and Suicide Attempts



Silins et al. (2014). Young Adult Sequelae of Adolescent Cannabis use: An Integrative Analysis. *The Lancet Psychiatry*, 1, 286-293.
Based on three prospective longitudinal studies from Australia and New Zealand.

Marijuana Use and Abuse of Other Substances

- Moderate evidence for association between cannabis use and development of alcohol use disorder.
- Limited evidence for association between cannabis use and development of opioid use disorder.



Source: <http://www.hazecam.net/camsite.aspx?site=burlington>

Mark Levine, MD, Commissioner, Vermont Department of Health
mark.levine@vermont.gov <http://healthvermont.gov/>