

# Why They Do Those Things They Do!

## Adolescent Brain Development And Substance Abuse

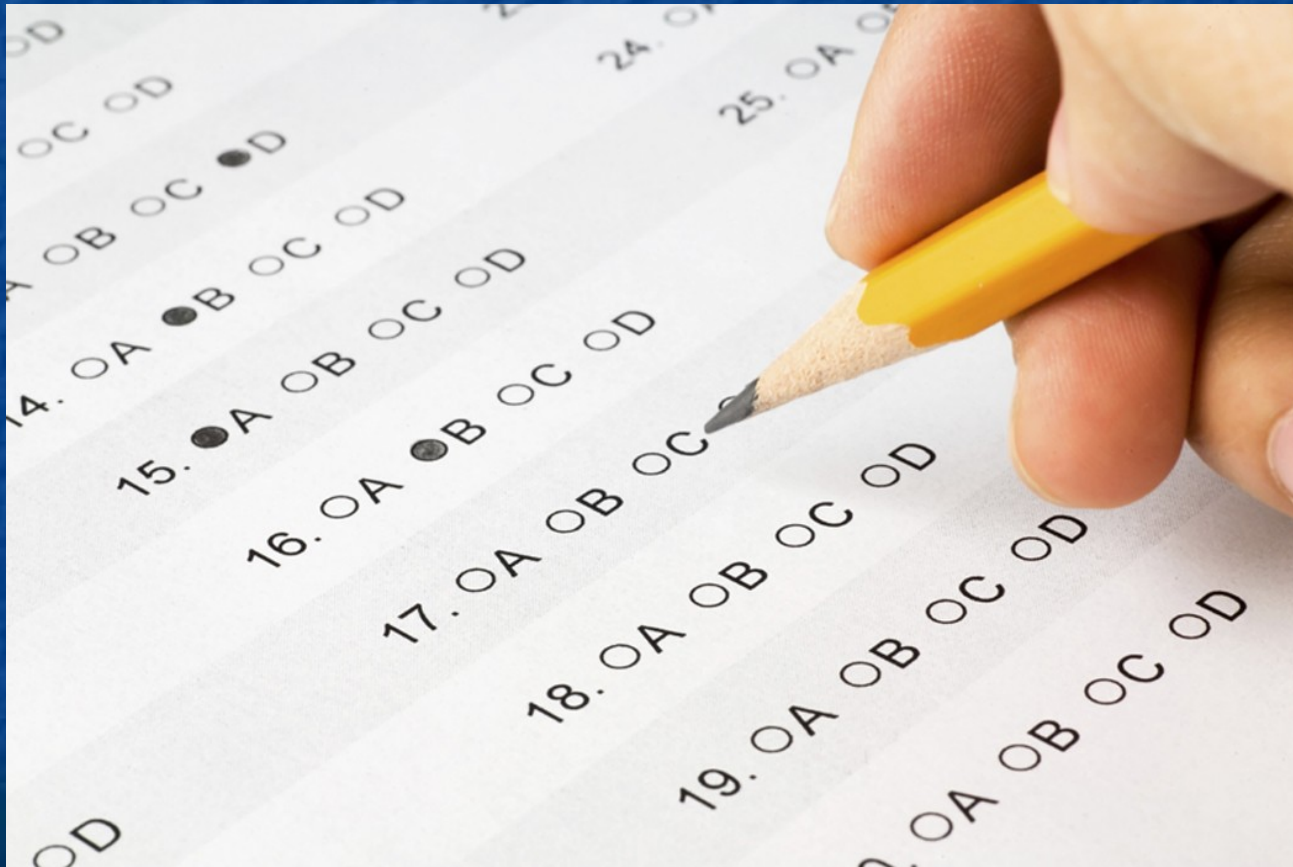
Designed by Brain Development Work Group  
February 2009



**By the end of this workshop participants will:**

- **Reflect on adolescent development and basic brain structure**
- **Understand risk taking and its relationship to substance use/abuse**
- **Examine skills adults need to help prevent substance use in youth**

# PRE-SURVEY



# Car in Lake

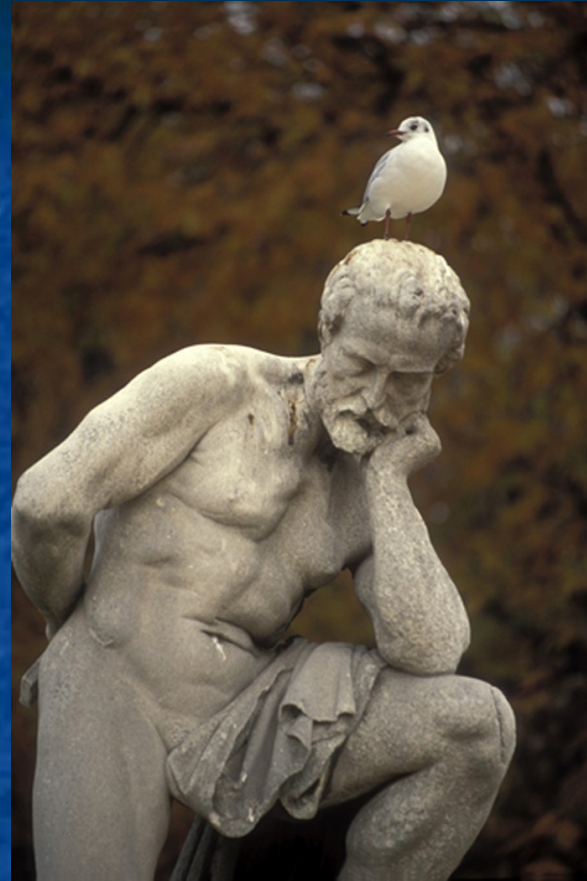
February 8, 2009



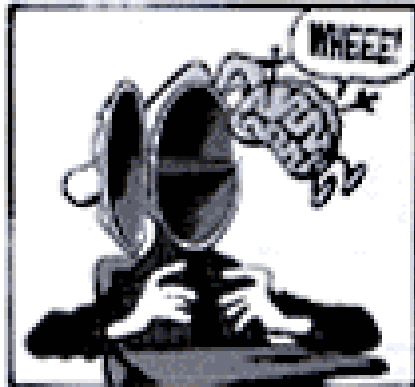
## Teens Today:

“Our youth now love luxury. They have bad manners, contempt for authority; they show disrespect for their elders and love chatter in place of exercise; they no longer rise when elders enter the room. They contradict their parents, chatter before company; gobble up their food and tyrannize their teachers.”

# Modern Day Thinking?



**Quote by Socrates, Fifth Century B.C.**



# TYPICAL CHANGES IN ADOLESCENT BEHAVIOR

- Spending more time with peers than with family
- Taking more risks and exploring

Spear (2000)

# CHANGES (cont.)

- Having conflict with authority, including parents
- Sleeping in later and staying up later
- Puberty (sexual maturation)

# Effect of Assets on Drug/Alcohol Use

Youth with particular asset...	...more likely to report no drug use
Positive peer role model	3 times
Positive non-parental adult role model	2 times
Involved in community activities	2 times
Involved in groups/sports	1.6 times
<u>Effects cumulative</u> : if all 9 youth assets present	<b>5.4 times</b>

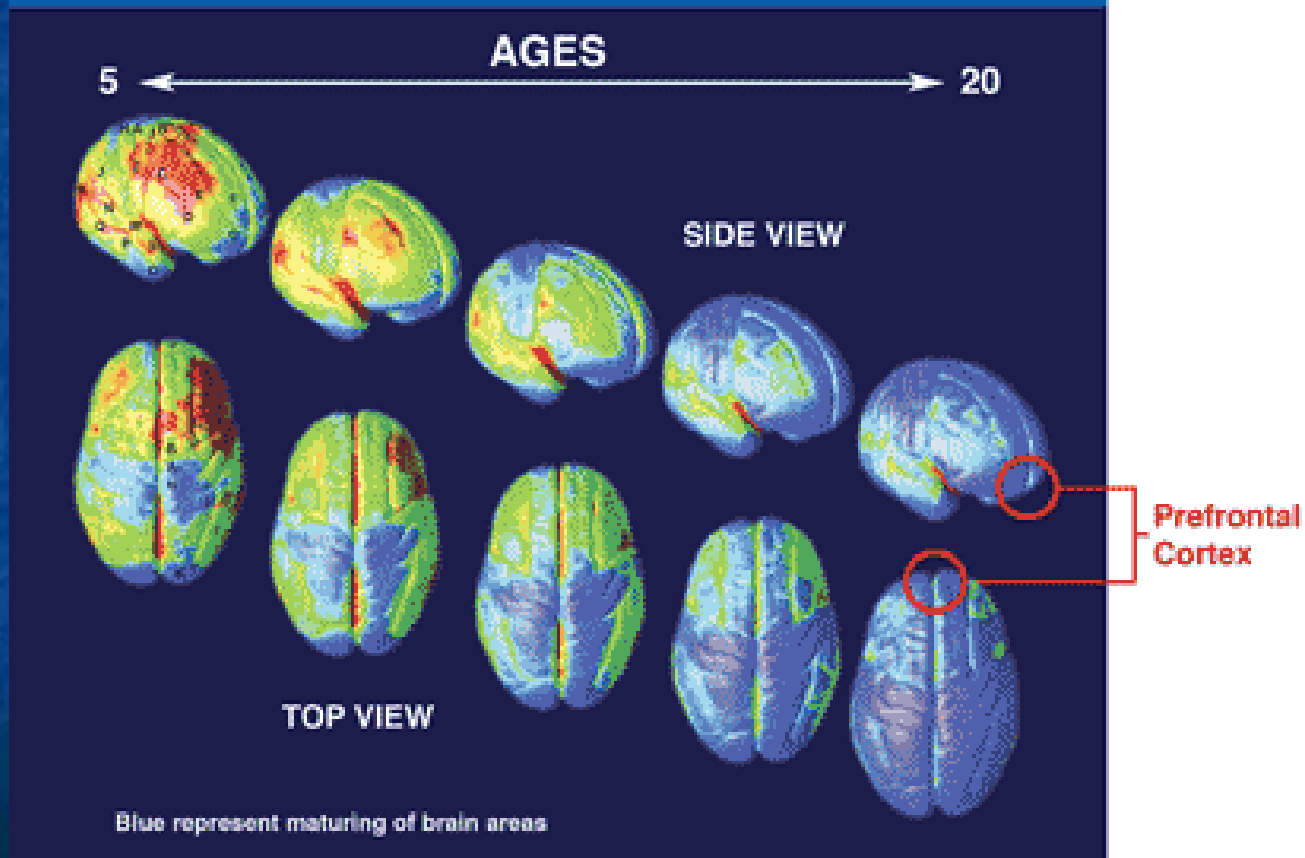
Oman, Roy F., Sara Vesely, Cheryl B. Aspy, Kenneth R. McLeroy, Sharon Rodine, and Ladonna Marshall (2004). "The potential protective effect of youth assets on adolescent alcohol and drug use." *American Journal of Public Health*, 94(8): 1425-1430.

# Brain Development 101

- Our brains were once believed to be completely developed by age 3, we now know that in adolescence, the brain is undergoing major changes;
- Teenage brains are not miniature adult brains.

# The brain continues to develop into adulthood up to 25 years old.

## IMAGES OF BRAIN DEVELOPMENT IN HEALTHY CHILDREN AND TEENS (AGES 5-20)



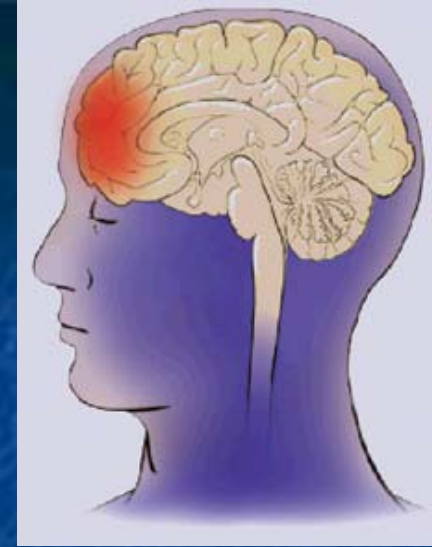
# Adolescent brain and behavior:

- From early adolescence through their mid-20s, a teen's brain develops somewhat unevenly, from back to front. This may help explain their endearingly quirky behavior but also makes them prone to risk-taking.

<http://www.drugfree.org/teenbrain/science/index.html>

# Pre-Frontal Cortex

(The Boss, Professor or Director of the Brain)



- During the teenage years, the area of the brain called the prefrontal cortex is developing.
- It's your thinking cap and judgment center.
- This part of the brain is involved with:

Reasoning, Planning, Decision Making  
and Problem Solving

# Hippocampus

- Memory and learning
- Converting short term memory to more permanent memory
- Research has shown that those youth who have been drinking heavily had a significantly smaller hippocampus (10 percent smaller).

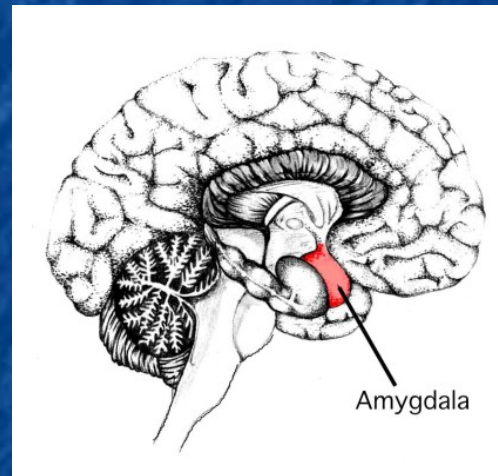


(Serendip-BrynMawr Educational Research)

# AMYGDALA

(uh-mig-duh-la)

Primal part of the brain (Caveman)

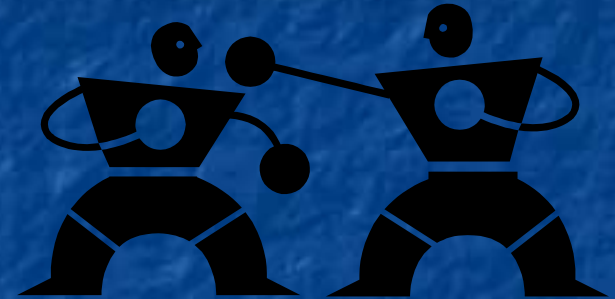


- Because the Pre-frontal cortex is not fully functioning, another part of the brain steps in to take its place to make decisions.

# Cont...

- The **Amygdala** is the emotional and instinctual center of the brain. Emotions such as happiness, anger and jealousy may override logic.
- Linked to the pleasure response: if it feels good...the Amygdala wants you to do it! This part of the brain encourages risk taking and impulsive behavior. (This is part of the limbic system).

# The fight between the amygdala and the prefrontal cortex in the teen brain.

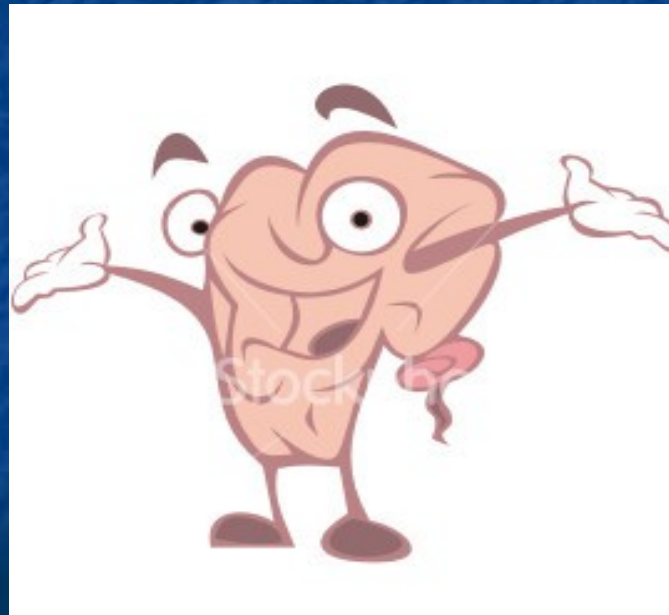


- The amygdala gangs up on the brain with all sorts of hormones creating moody, irritable, unpredictable and sometimes irrational behavior, risk taking, and conflicts with family members.

# “What were you thinking?!”

- Teens do not think the way adults do!
- Most adults think with the frontal cortex—the rational part of the brain.
- Teens typically process information with the amygdala (uh-mig-duh-lu). This is the instinctual, emotional, impulsive, primal part of the brain.

A major reason people take drugs is because they like its effect on the Brain.



*How do drugs work  
in the brain?*

**We know that despite  
their many differences, most  
abused substances enhance  
the  
Dopamine and Serotonin  
Pathways**



- **We remember feelings of pleasure from the neurotransmitter dopamine.**
- **Dopamine sends “feel-good” messages to our brain and body, connecting the pleasure we experienced to the thing we enjoyed.**

[http://parentsempowered.org/resources/teaching\\_tools.pdf](http://parentsempowered.org/resources/teaching_tools.pdf)

# The Reward System

What are some natural highs?

- Good grade on a paper
- Compliments
- Hugs
- Food
- Healthy risk taking (rock climbing, skiing, white water rafting, etc.)

# Natural Rewards Elevate Dopamine Levels:

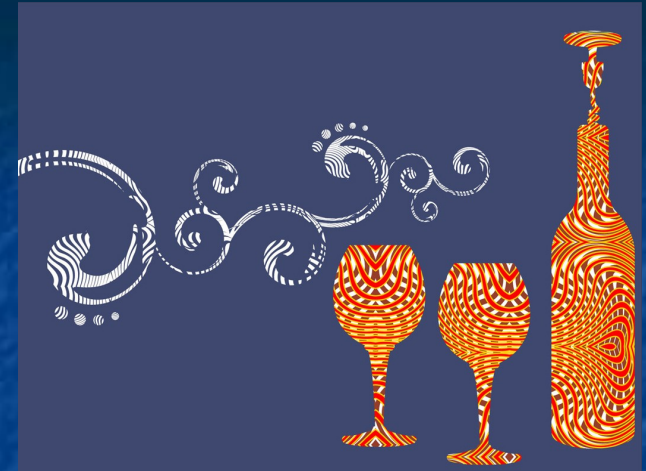
- Food .....50%
- Sex.....100%

• **Drugs of abuse can flood the brain with 2-10 times the amount of dopamine associated with natural rewards**

# However, Alcohol Hijacks Our Brain's Pleasure-Reward System

- Alcohol stimulates the production of the neurotransmitter dopamine, tricking your brain into generating pleasure-reward feelings from a harmful chemical instead of a real experience.

- Alcohol can also damage the ability to sense pleasure from real things and experiences – leaving a young person feeling “flat” about things he or she previously enjoyed.
- Drinking under the age of 21 can program your brain to crave the fake pleasure alcohol provides; this may cause addiction.



# Addiction

- Over time of use, more and more drugs/alcohol are needed to get the same high. This increases the risk of addiction.
- A person has an addiction when he or she becomes dependent on or craves a drug all of the time.

# Formal Definition of Addiction

- Addiction is defined as a chronic, relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences. It is considered a brain disease because drugs change the brain - they change its structure and how it works. These brain changes can be long lasting, and can lead to the harmful behaviors seen in people who abuse drugs.

# And to Clarify!

ALCOHOL

*IS*

A

DRUG



# Substance Use/Abuse and the Teenage Brain

- How do you think the teenage brain is affected by substance use/abuse?

Youth who begin drinking alcohol before the age of 15 are five times more likely to develop alcohol problems than those who start after age 21.

(The NSDUH Report, 10/22/04).

“The combination of a developing prefrontal cortex and raging hormones presents some of the biggest challenges in parenting”.

-David Walsh, Ph.D., *Why Do They Act That Way?*

# **POWERFUL STATISTICS!**

- **Kids who begin drinking before the age of 15 are more likely to become alcoholics within ten years of beginning to drink.**
- **Only 7% of those who begin drinking at age 21 become alcoholics.**

# HEALTH AND SOCIAL PROBLEMS

- Vermont has the highest rate in the country of underage drinking in the past month (38.3%) and the second highest rate of underage binge drinking in the past month (28%). (NSDUH, 2006)
- Among college students nationwide, 19% report consuming 5 or more drinks on at least 5 different occasions in the past month. (NSDUH, 2006)

# Statewide YRBS

- According to the 95-07 YRBS:
  - Alcohol use by 12th graders dropped from 63 percent in 1995 to 55 percent in 2007
  - Alcohol use by 8th graders dropped from 40 percent in 1995 to 19 percent in 2007
  - Older students binge drink (more than 5 drinks) more than younger students
  - 39% of 12th graders binge drink in 2007 compared to 42% in 1995
  - 8% of 8th graders binge drink in 2007 compared to 12% in 1995

# YRBS

- ADD YOUR OWN LOCAL DATA

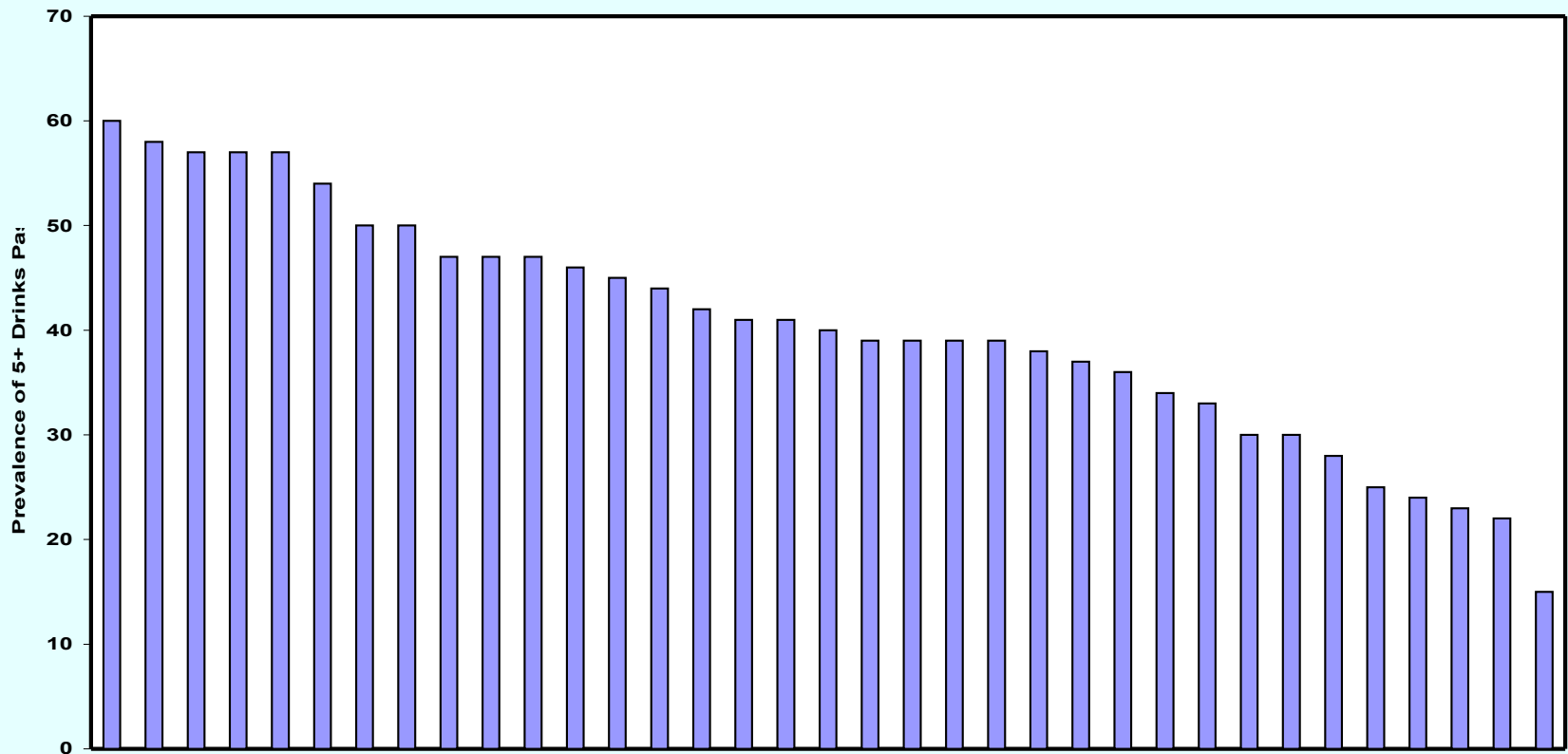
# EUROPEAN MYTH

- The notion that European youths consume alcohol more responsibly because they are introduced to drinking at an early age is a myth.
- Consumption and binge rates are significantly higher in European countries where the drinking age is as low as 16.
- In 1999 New Zealand lowered the drinking age from 20 to 18, which provided the opportunity for a “natural” experiment. The result was a large increase in alcohol-related crash injuries among 18-19 year-olds.

Kypri, et al.(2006) The American Journal of Public Health, Vol. 96

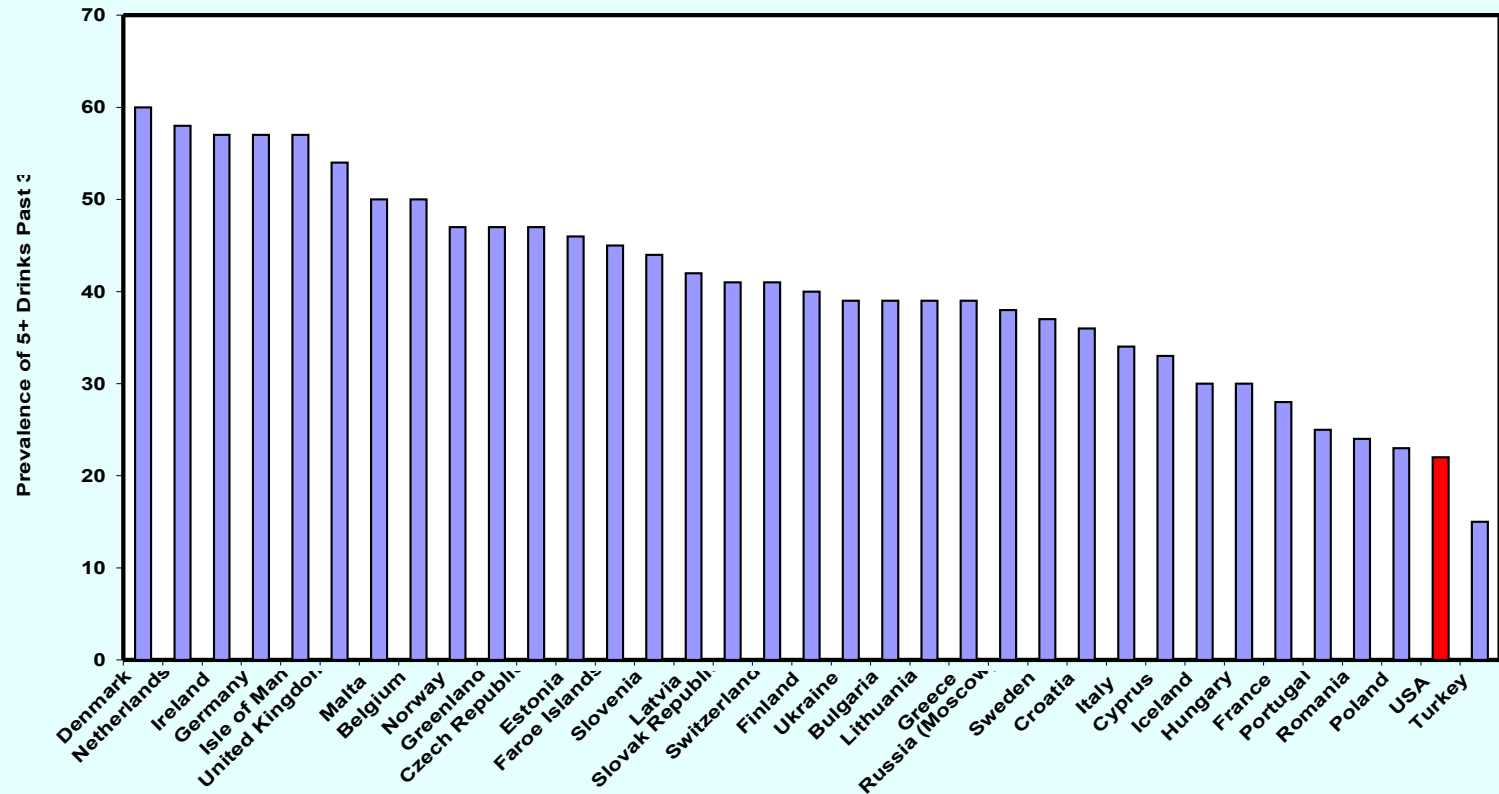
# International Data

## European School Survey Project on Alcohol and Other Drugs (ESPAD)



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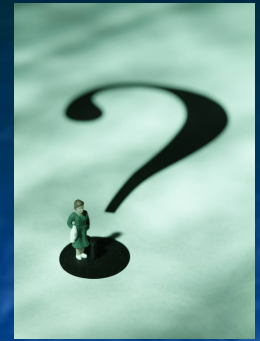
USA From MTF Study

# Illicit drug use

- More than 67 percent of young people who start drinking before the age of 15 will try an illicit drug.
- Children who drink are 7.5 times more likely to use any illicit drug, more than 22 times more likely to use marijuana and 50 times more likely to use cocaine than children who never drink.

*"Cigarettes, Alcohol, Marijuana: Gateways to Illicit Drug Use," Center on Addiction and Substance Abuse, Columbia University, 1994*

# So What Can I Do?



"What parents may not realize is that children say parental disapproval of underage drinking is the key reason they have chosen not to drink."

**Charles Curie, former Substance Abuse and Mental Health Services Administration (SAMHSA) administrator, U.S. Department of Health and Human Services.**

## Three Skills to help prevent underage drinking:

1. Bonding
2. Boundaries
3. Monitoring

# Bonding

Bonding is a feeling of being loved and accepted by others. Children who feel close to their parents are less likely to drink. To increase bonding with your teenager, apply the following ideas.

- Create a positive, loving home environment
- Have daily positive interaction & keep talking
- Notice your child's emotional well-being

- Research shows teens who regularly eat as a family (5-7 times per week) are 33 percent less likely to use alcohol.



Research by The National Center on Addiction and Substance Abuse at Columbia University

# Boundaries

Boundaries are the rules and expectations set by parents that define what they expect of their children. Parents need to set clear rules and expectations about no underage drinking.

- Teach the risks of underage drinking
  - Share knowledge about the brain & early alcohol use
- Set clear rules and expectations
- Help your children choose friends wisely

# Monitoring

Monitoring is knowing where your kids are, who they are with, and what they are doing. To improve your monitoring skills, apply the following steps.

- Know your child's activities
- Ensure an alcohol-free environment

# Monitoring (cont)

- Maintain monitoring even when they may be home alone
- Remember that risk taking is normal adolescent behavior. Assist with directing healthy choices and behavior

# One More Thing!

- Parents and other adults can make a difference by modeling responsible use of substances.

This may include using medicine only as prescribed, drinking moderately and hosting social/family gatherings that don't center on alcohol and other drug use.

# WHAT ELSE?

Post-Survey

***Thank You !***

Local Contact Information