Adolescent Substance Use Disorder
Prevalence and Trends

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The Teen Brain
It’s Just Not Grown Up Yet
Brain Maturation

**Time-Lapse Brain**

Gray matter wanes as the brain matures. Here 15 years of brain development are compressed into five images, showing a shift from red (least mature) to blue.

- Age 5
- Age 12
- Age 20
- Age 8
- Age 16

**PERCENTAGE OF GRAY MATTER**
- 50%
- 40%
- 30%
- 20%
- 10%
- 0%
Gas Pedal versus Brakes
Developmental Aspects of Substance Use

• Separating away from parents
• Gaining acceptance and popularity with peers
• Developing a sense of autonomy and independence
• Establishing a personal identity and self-image
• Seeking fun and adventure
• Rebelling against authority
MONITORING the FUTURE
NATIONAL SURVEY RESULTS ON DRUG USE 1975–2015

2015 Overview

Key Findings on Adolescent Drug Use

Lloyd D. Johnston
Patrick M. O'Malley
Richard A. Miech
Jerald G. Bachman
John E. Schulenberg

Sponsored by The National Institute on Drug Abuse at The National Institutes of Health
Behavioral Health Trends in the United States: Results from the 2014 National Survey on Drug Use and Health
Hip Statistics

https://youtu.be/C-_793V9zjA
Past Year Initiation (First Use) of Selected Substances Among Adolescents Aged 12-17 in Nebraska, by Substance Type (Annual Averages, 2010-2014)

- Alcohol: 7.8%
- Marijuana: 4.3%
- Cigarettes: 5.0%
- Nonmedical Use of Psychotherapeutics: 2.2%

Past Mont Illicit Drug Use Among Adolescents Aged 12-17 in Nebraska and the United States (2010-2011 to 2013-2014)
ONE PERSON DIES EVERY 6 SECONDS FROM A TOBACCO-RELATED DISEASE.

That's 10 people per minute.

Each day, nearly 3,300 youth under the age of 18 try their 1st cigarette.
Past Month Cigarette Use Among Adolescents Aged 12-17 in Nebraska and the United States (2010-2011 to 2013-2014)
Adolescent Aged 12-17 in Nebraska and the United States Who Perceived No Great Risk from Smoking One or More Packs of Cigarettes a Day (2010-2011 to 2013-2014)
E-Cigs and Vapor Pens

Teens are more likely to use e-cigarettes than cigarettes.

- 8th grade: 8.7% (Cigarettes: 4.0%) - Past month use
- 10th grade: 16.2% (E-Cigarettes: 7.2%)
- 12th grade: 17.1% (E-Cigarettes: 13.6%)

Only 14.2% of 12th graders view e-cigarette use as harmful, which is less than 5 students in the average class.

The National Institute on Drug Abuse is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world’s research on the health aspects of drug abuse and addiction. Fact sheets on the health effects of drugs of abuse and information on NIDA research and other activities can be found at www.drugabuse.gov.
Cigarette Advertising

You've come a long way, baby.

Virginia Slims.

They're the cigarette made just for women. They're thinner than the last cigarette men smoked. With the full rich Virginia flavor women like.
E-cigarette Advertising

E-cigarette use among youth is rising as e-cigarette advertising grows

- Dollars spent on e-cigarette advertising
- Past 30-day e-cigarette use among youth

Dollars spent on e-cigarette advertising (in millions)

2011 2012 2013 2014

Past 30-day e-cigarette use among youth (%)

How an electronic cigarette works

The electronic cigarette contains a battery that activates a heating device, atomizing liquid nicotine inside a cartridge and producing a vapor that is inhaled.

Source: allhookah.net

Tim Summers / The Detroit News
Vapor Pen

How It Works.

LED Light: Indicates when charged, when in use and when needs recharging.

Lithium Ion Battery: Larger batteries last up to three days.

Button: Push to vapourize e-liquid and activate on/off function.

Clearomiser: Contains e-liquid.

Microchip: Stops overcharge, switches battery off when empty.

Atomizer.

Wick: Soaks e-liquid prior to vapourizing.
Vaping Liquids
Marijuana Vaping

Pyrex / Stainless BUD Vaporizer

- 0.3ml
- 0.5ml
- 1.0ml

- Huge Vapor
- No Leaking
Adolescents Aged 12-17 in Nebraska and the United States Who Perceived No Great Risk from Smoking Marijuana Once a Month (2010-2011 to 2013-2014)
Marijuana: Perceived Risk and Use

![Graph showing perceived risk and availability of marijuana over years.](image-url)
Figure 1. Marijuana use in the past month among youths aged 12 to 17, by state: percentages, annual averages, 2013–2014

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Surveys on Drug Use and Health (NSDUHs), 2013 and 2014.
DABS (Butane Hash Oil)
How Dabs Are Used
HEAVY MARIJUANA USE BY TEENS IS LINKED TO:\n
**Educational Outcomes**
- lower grades and exam scores
- less likely to enroll in college

**Life Outcomes**
- lower satisfaction with life
- more likely to earn a lower income
- more likely to be unemployed

Risks of Adolescent Marijuana Use

- Cognitive Effects
  - Deficits in:
    - Visuospatial working memory
    - Verbal encoding,
    - Attention
    - Information processing speed
    - Inhibitory control
  - Drop in IQ up to 8 points\(^3\)

Risks of Adolescent Marijuana Use

- Psychological/Emotional effects:
  - Psychotic disorders, such as schizophrenia
  - Major Depression
  - Anxiety Disorders

- Substance Use Disorders

- Other Risky Behaviors
• 25 states have passed “medical marijuana laws.
• Protection for folks against arrest or conviction for possession for medical purpose
• Permit the distribution or marijuana through retail dispensary system
• Marijuana remains a Schedule 1 drug
States with Medical Marijuana Laws

How States Differ on Legal Use of Marijuana

- Adult Use & Medical
- Medical
- Cannabidiol Only
- No Laws

Note: As of June 8
Source: USA TODAY NETWORK research by Karl Gelles, USA TODAY
Figure 1. Marijuana use in the past month among youths aged 12 to 17, by state: percentages, annual averages, 2013–2014

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Surveys on Drug Use and Health (NSDUHs), 2013 and 2014.
Medical Evidence for Use of Marijuana

- Nausea and Vomiting - Cancer
- Appetite Loss - Cancer/HIV
- Neuropathic Pain
- Muscle Spasticity

- Effects tend to be modest; risks of long term use; addiction; smoke inhalation as a delivery system

Leung L. 2011
Alcohol

- #1 Used Substance by Adolescents in Nebraska
- 35,000 Report Binge Use Within Past Month
- 26.1% 8th Grade; 47.1% 10th Grade; 64% 12th Grade report use within the last month.
Past Month Binge Alcohol Use Among Individuals Aged 12-20 in Nebraska
And the United States
(2010-2011 to 2013-2014)

# Nebraska State Profile and Underage Drinking Facts

State Population: 1,842,641  
Population Ages 12–20: 230,000

<table>
<thead>
<tr>
<th>Ages 12–20</th>
<th>Percentage</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past-Month Alcohol Use</td>
<td>24.6%</td>
<td>57,000</td>
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<tr>
<td>Past-Month Binge Alcohol Use</td>
<td>16.7%</td>
<td>38,000</td>
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<table>
<thead>
<tr>
<th>Ages 12–14</th>
<th>Percentage</th>
<th>Number</th>
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<tbody>
<tr>
<td>Past-Month Alcohol Use</td>
<td>3.9%</td>
<td>3,000</td>
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<tr>
<td>Past-Month Binge Alcohol Use</td>
<td>2.2%</td>
<td>2,000</td>
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<thead>
<tr>
<th>Ages 15–17</th>
<th>Percentage</th>
<th>Number</th>
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<tbody>
<tr>
<td>Past-Month Alcohol Use</td>
<td>20.1%</td>
<td>14,000</td>
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<tr>
<td>Past-Month Binge Alcohol Use</td>
<td>12.0%</td>
<td>9,000</td>
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<thead>
<tr>
<th>Ages 18–20</th>
<th>Percentage</th>
<th>Number</th>
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<tbody>
<tr>
<td>Past-Month Alcohol Use</td>
<td>46.1%</td>
<td>39,000</td>
</tr>
<tr>
<td>Past-Month Binge Alcohol Use</td>
<td>33.1%</td>
<td>28,000</td>
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- Alcohol-Attributable Deaths (under 21): 26
- Years of Potential Life Lost (under 21): 1,549

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<thead>
<tr>
<th>Traffic Fatalities, 15- to 20-Year-Old Drivers with BAC &gt; 0.01</th>
<th>Percentage of All Traffic Fatalities</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32.0%</td>
<td>11</td>
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Adolescents Aged 12-17 in Nebraska and the United State Who Perceived No Great Risk from Having Five or More Drinks Once or Twice a Week (2010-2011 to 2013-2014)
<table>
<thead>
<tr>
<th>Drug</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adderall</td>
<td>6.8%</td>
</tr>
<tr>
<td>Vicodin</td>
<td>4.8%</td>
</tr>
<tr>
<td>Tranquilizers</td>
<td>4.7%</td>
</tr>
<tr>
<td>Cold Medicines</td>
<td>4.1%</td>
</tr>
<tr>
<td>OxyContin</td>
<td>3.3%</td>
</tr>
<tr>
<td>Ritalin</td>
<td>1.8%</td>
</tr>
<tr>
<td>Marijuana</td>
<td>35.1%</td>
</tr>
<tr>
<td>K2/Spice (&quot;synthetic marijuana&quot;)</td>
<td>5.8%</td>
</tr>
<tr>
<td>MDMA/Ecstasy</td>
<td>3.6%</td>
</tr>
<tr>
<td>Cocaine</td>
<td>2.6%</td>
</tr>
<tr>
<td>LSD</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

*The percentage of 12th graders who have used these drugs in the past year.

After marijuana, prescription and over-the-counter medications account for most of the top drugs abused by 12th graders in the past year.
Overdose Deaths vs Traffic Accidents

Motor vehicle traffic, poisoning, drug poisoning, and unintentional drug poisoning death rates: United States, 1999 – 2010

Deaths per 100,000 population

- Motor vehicle traffic
- All Poisoning
- Drug poisoning
- Unintentional drug poisoning

DRUG OVERDOSES KILL MORE THAN CARS, GUNS, AND FALLING.

- Falling: 28,360 deaths
- Guns: 32,351 deaths
- Traffic accidents: 33,692 deaths
- Drug overdoses: 41,340 deaths (16,917 from opioid pain medicine)

Every day, 2,500 American youth abuse a prescription pain reliever for the first time

Nearly 1 in 20 high school seniors has taken Vicodin, 1 in 30 has abused OxyContin

Over 50% of individuals 12 years or older used pain relievers nonmedically from a friend or relative

Adolescent abuse of prescription drugs is frequently associated with other risky behavior, including abuse of other drugs and alcohol

The number of opioids prescribed to adolescents and young adults (ages 15 to 29) nearly doubled between 1994 and 2007
Past Year Nonmedical Use of Pain Relievers Among Adolescents Aged 12-17 in Nebraska and the United States (2010-2011 to 2013-2014)
• AAP Policy Recommends Pediatricians Offer Medication for Opioid Addiction
• Medication-Assisted Treatment of Adolescents With Opioid Use Disorders
• COMMITTEE ON SUBSTANCE USE AND PREVENTION
Stimulants

How are Methamphetamines Used?

- Orally
- Snorted
- Smoked
- Injected

Smoking or injecting the drug delivers it very quickly to the brain, where it produces an immediate, intense euphoria.
Nonmedical Use of Prescription Stimulant Medications
Reasons Adolescents Use Medications

- Self-Treatment
- Experimentation
- Euphoria
- Intoxication
Effects of Stimulant Medications

- Produce extra brain activity
- Increase alertness
- Improve energy
- Promote a sense of well-being
Signs of Stimulant Use
Common OTC Cold & Cough Medications
What’s the Big Deal?

• Medically used for cough suppression and safe if used according to label instructions
• At high doses, causes mild distortions of color and sound to visual hallucinations, “out-of-body” dissociative sensations, and loss of motor control
• Street names: Triple C;s, Robotripping, Orange Crush, Skittles, Red Devils

Dextromethorphan (DXM)

- DXM is easy to get
- DXM is cheap
- Cough medicine seems safer
- DXM is popular
- Their parents don’t know
Effects of DXM

- Impaired vision
- Nausea and vomiting
- Sweating and fever
- Rapid breathing
- Increased and irregular heart rate and blood pressure
- Slurred speech
- Impaired judgement and mental function
- Rapid eye movements
EVIDENCE-BASED PREVENTION PROGRAMS FOR ADOLESCENT AND CHILDREN SUBSTANCE USE DISORDERS

REDUCE the RISK
Prevention

The Drug Danger Zone: Most Illicit Drug Use Starts in the Teenage Years

Percentage of Past-Year Initiates among Those Who Have Never Used

Age Group | Percentage
----------|----------
12-13     | 2.9%     
14-15     | 8.0%     
16-17     | 11.2%    
18-20     | 10.4%    
21-25     | 4.5%     
25 or Older| 0.3%    

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2011 and 2012.
Prevention

9 out of 10 people with substance problems started using by age 18.
Drug-Free Communities (DFC) Support Program Findings on Illicit Use of Prescription Drugs from the 2014 National Evaluation

Core Measure Data for FY 2013 Grantees

Past 30 Day Use

- Middle School: 2.7% First Outcome, 2.1% Most Recent Outcome
- High School: 7.1% First Outcome, 5.6% Most Recent Outcome

Perception of Risk

- Middle School: 79.1% First Outcome, 79.4% Most Recent Outcome
- High School: 81.6% First Outcome, 81.5% Most Recent Outcome

Prevention Works!
What Does Effective Prevention Look Like?

- Interactive
- Focus on building skills in:
  - Drug Resistance
  - General Competence Skills
- Implemented over multiple years!
School-Based Prevention Approaches

- Social Resistance Skills
- Normative Education
- Competence Enhancement
Social Resistance Skills

- Recognize Risky Situations
  - Ways to Avoid These Situations
  - Ways to Effectively Deal With the Situations
- Ways to Handle Peer Pressure
- Education About Advertising Promotion
Normative Education

• Correct Inaccurate Perceptions
  • Actual Local Prevalence Rates
  • National Surveys
• Undermine Popular Beliefs That Substance Use Is:
  • Acceptable
  • Not Particularly Dangerous
Competence Enhancement

• General Problem-Solving and Decision-Making Skills
• Skills to Resist Interpersonal and Media Influences
• Skills to Increase Self-Control and Self-Esteem
• Coping to Relieve Stress and Anxiety
  • Cognitive Coping Skills
  • Behavioral Relaxation
• Social and Assertiveness Skills