Excessive Alcohol Use
Surveillance 101

CSTE Pre-Conference Workshop
June 9, 2013
Session Agenda

Part 1
• Data sources, outcome and consumption indicators

Part 2
• Using data to describe the problem of excessive alcohol use at the state and local level

Part 3
• Taking action to prevent excessive alcohol use at the state and local level
PART 1: OUTLINE

- CDC Alcohol Program
- Data sources
- Outcome indicators
- Consumption indicators
Public Health System

**Community**
- Communities and Coalitions

**Local**
- County and City Health Departments

**State**
- State, Territorial, and Tribal Health Departments

**Federal**
- Centers for Disease Control and Prevention
- U.S. Department of Health and Human Services
CDC Alcohol Program

**Mission:**
To strengthen the scientific foundation for preventing excessive alcohol consumption.

**Our Goals**
- Improve Surveillance of Excessive Alcohol Consumption
- Conduct Applied Public Health Research
- Build State and Local Alcohol Epidemiology Capacity
- Provide National Leadership
Public Health Impact of Excessive Drinking

- 80,000 deaths every year
- 2.3 million Years of Potential Life Lost (YPLL) every year
- Cost
  - $223.5 billion in economic costs (2006) or ~$1.90/drink
  - $27 billion (12%) for underage drinking
  - $94.2 billion (42%) paid by government or ~$0.80/drink
- Most excessive drinkers are not alcohol dependent

Types of Excessive Alcohol Use

- **Binge drinking (or heavy episodic drinking)**
  - For women, 4 or more drinks during a single occasion.
  - For men, 5 or more drinks during a single occasion

- **Heavy drinking**
  - For women, more than 1 drink per day on average
  - For men, more than 2 drinks per day on average

- **Any consumption by under age 21, pregnant women**
Binge Drinking is the Main Problem

- Accounts for most health and economic costs
  - >1/2 of the deaths due to excessive drinking
  - 2/3 of the Years of Productive Life Lost (YPLL)
  - 3/4 of the economic costs

- Binge drinking
  - ≥4 drinks per occasion for women and ≥5 for men
  - Most common pattern of excessive drinking in the United States
    - >90% of excessive drinkers binge drink

CDC. Vital Signs: Binge Drinking Prevalence, Frequency and Intensity Among Adults–United States, 2010
NIAAA. NIAAA Council approves binge drinking definition Newsletter. 2004;3(3)
Health Effects of Binge Drinking

Binge drinking can lead to:

- Motor Vehicle Crashes
- Violence Against Others
- Spread of HIV and Sexually-Transmitted Diseases (STDs)
- Unplanned Pregnancy
- Fetal Alcohol Spectrum Disorders and Sudden Infant Death Syndrome (SIDS)
- Alcohol Dependence
Outcome Indicators
Mortality

- Alcohol-Attributable Deaths
- Years of Potential Life Lost (YPLL)
Alcohol-Attributable Deaths

54 alcohol-attributable causes of death

- Selected from large meta-analyses
- Strong evidence linking alcohol use to cause
- WHO Guide for Monitoring Alcohol Consumption and Related Harms
Alcohol-Attributable Fractions (AAF)

The key factor in estimating alcohol-attributable deaths (AAD) and Years of Potential Life Lost (YPLL)

Calculation:

$$AAD = AAF \times \text{Cause-Specific Mortality}$$
Types of Conditions

- Conditions that are fully attributable to alcohol (AAF = 1.0)
  - All deaths are counted
  - No estimation required

- Conditions that are partially attributable to alcohol (AAF <1.0)
  - Selected direct estimates of AAF
  - Calculated indirect estimates
Consumption Levels for Indirect Estimates

- Three levels: low, medium, and high
- Cut-points specified in meta-analyses
- Gender-specific (English & Holman)

Years of Potential Life Lost (YPLL)

- Alcohol-attributable deaths stratified by gender and age, using standard 5-year age groupings.
- Average life expectancies calculated for each 5-year group.
- Deaths multiplied by life expectancies to yield YPLL
Alcohol and Public Health: Alcohol-Related Disease Impact (ARDI)

ARDI is an online application that provides national and state estimates of alcohol-related health impacts, including deaths and years of potential life lost (YPLL). These estimates are calculated for 54 acute and chronic causes using alcohol-attributable fractions, and are reported by age and sex.

To begin, choose your report and location below.

View Reports

Choose Report
- Alcohol-Attributable Deaths
  Estimates the total number of deaths attributable to alcohol

Choose Location
United States or Select State

Choose Location
- Years of Potential Life Lost
  Estimates the total number of alcohol-related years of life lost resulting from premature death

- Alcohol-Attributable Fractions
  Estimates the proportion of deaths from various causes that are attributable to alcohol

Custom Data
Use the Custom Data feature to conduct your own analyses of alcohol-related harms using the ARDI application.

ARDI Information
- Methods
- Alcohol-Related ICD Codes
- FAQ
- Glossary
- Privacy Info
ARDI Custom Data

- Allows users to enter death and prevalence data below state level
- Retrieve AAD and YPLL reports
- Store multiple datasets
- Password protected
ARDI Custom Data

The Custom Data section allows you to estimate alcohol-attributable deaths (AAD) and years of potential life lost (YPLL) for other locations or years than those included in the ARDI application. In order to generate each type of report, you need to choose three types of datasets (Prevalence of Alcohol Consumption, Relative Risks and Direct Alcohol-Attributable Fractions, and Total Deaths). You have the option of either using a current default data set already listed in the drop down menu or creating your own. You can create your own by either entering data directly into ARDI for the Prevalence of Alcohol Consumption and Relative Risks and Direct Alcohol-Attributable Fractions data sets or by uploading new data for the Total Deaths data sets. For a more detailed information regarding how to create each of the data sets, please refer to the ARDI Custom Data User Manual.

View Data Sets

Prevalence of Alcohol Consumption
Average for California 2001-2005

Relative Risks and Direct Alcohol-Attributable Fractions
United States 2001-2005

Total Deaths
California

Generate a Report

1. Select data sets
   - Prevalence of Alcohol Consumption
     Average for California 2001-2005 or Create New
   - Relative Risks and Direct Alcohol-Attributable Fractions
     United States 2001-2005 or Create New
   - Total Deaths
     California or Upload Data (.CSV or .XML)

2. Show a report for
   - Alcohol-Attributable Deaths
   - Years of Potential Life Lost
Consumption Indicators
Data Sources

- Behavioral Risk Factor Surveillance System
- Youth Risk Behavior Surveillance System
CDC Behavioral Risk Factor Surveillance System (BRFSS)

- Random-digit-dial landline and cellular telephone survey of adults (≥18)
- State-based system coordinated by CDC
- Data collected in all states, DC, and 3 territories
- Monitors a variety of health risk behaviors, including alcohol
- Over 457,000 adults surveyed in 2011
Past 30 days:

- Current use Days/Week or Days/Month
- Average number of drinks on drinking-days
- Binge drinking (4+ women/5+ men)
- Largest number of drinks on occasion
Binge Drinking Measures in BRFSS

- **Prevalence**: Percentage of binge drinkers from sample.
- **Frequency**: Number of binge drinking episodes in past 30 days.
- **Intensity**: Average largest number of drinks consumed by binge drinkers on any occasion.
BRFSS Modules: Alcohol

- Binge Drinking
- Alcohol Screening and Brief Interventions (ASBI)
Binge Drinking Module

- **Beverage type:**
  - # of (12-ounce) beers
  - # of (5-ounce) glass of wine
  - # of (1.5-ounce/1 shot) liquor
  - # of other pre-mixed, flavored drinks

- **Drinking Location**
- **Driving after drinking**
- **Cost of alcohol (payment), if at restaurant/bar/club**
Biannual school-based survey of high school students in grades 9 thru 12
Paper-and-pencil survey
Monitors a variety of health risk behaviors, including Alcohol (6 questions)
Over 15,000 students surveyed in 2011
National YRBS: Alcohol Questions

- Lifetime alcohol use
- Age of initiation
- Current alcohol use
  - 1+ drinks of alcohol on 1+ days in the past 30 days
- Binge drinking
  - 5+ drinks in a row on 1+ days during the past 30 days
- Largest number of drinks in a row
- Access to alcohol
YRBS: Optional Alcohol Questions

- **Usual beverage type**
  Beer, flavored malt beverages, wine coolers, wine, liquor, other

- **Usual drinking location**
  Home, while riding/driving a car, restaurant/bar/club, public place, public event, school
Binge Drinking

Nationwide Problem, Local Solutions

New estimates show that binge drinking is a bigger problem than previously thought. More than 38 million US adults binge drink, about 4 times a month, and the largest number of drinks per binge is an average of 5. This behavior greatly increases the chances of getting hurt or hurting others due to car crashes, violence, and suicide. Drinking too much, including binge drinking, causes 40,000 deaths in the US each year and in 2006 cost the economy $225.9 billion in economic costs resulting from excessive alcohol consumption in the United States.

Methods: CDC analyzed data collected in 2010 on the prevalence of binge drinking (defined as four or more drinks for men or five or more drinks for women on an occasion) among adults aged 18 years and older in the United States. The data came from the National Health Interview Survey (NHIS) and the Behavioral Risk Factor Surveillance System (BRFSS). The data were weighted to be representative of the US population.

Results: The overall prevalence of binge drinking was 49.7% in 2010. Binge drinking is a problem in all states, even in states with fewer binge drinkers, because they are bingeing more often and in larger amounts.

Implications for Public Health Practice: More widespread implementation of Community Guide-recommended interventions (e.g., measures controlling access to alcohol and increasing prices) could reduce the frequency, intensity, and ultimate prevalence of binge drinking, as well as the health and social costs related to it.

Introduction

Excessive alcohol use accounted for an estimated 90,000 deaths and 2.5 million years of potential life lost (YPLL) in the United States each year during 2001–2008, and an estimated 32,935.5 billion in economic costs in 2008 (1). Binge drinking, accounted for more than half of those deaths, two-thirds of the YPLL (2), and three-quarters of the economic costs (3). Binge drinking also is a risk factor for many health and social problems, including: violence, suicide, violent, and anxiety and mood disorders, acute myocardial infarction, and sexually transmitted diseases, unintended pregnancy, fetal alcohol syndrome, and sudden infant death syndrome (5).

In 2010, 85% of all alcohol-impaired driving episodes were reported by persons who also reported binge drinking (6). In the United States, binge drinking accounts for more than half of the alcohol consumed by adults (7) and 90% of the alcohol consumed by youths (8). However, most binge drinkers are not alcohol independent (9).

Reducing the prevalence of binge drinking among adults is a leading health indicator in Healthy People 2020 (HP2020) (10). To assess trends in binge drinking nationwide and by state, CDC analyzed developmental data from the 2010 Behavioral Risk Factor Surveillance System (BRFSS) on the prevalence of binge drinking among adults, and on the frequency and intensity of drinking among respondents who reported binge drinking.

The 2011 BRFSS developmental dataset included combined landline and cellular telephone-only adults and used the rolling method for weighting.
Binge Drinking, U.S. Adults, 2010

- Prevalence: 17.1%
- Frequency: 4.4 episodes
- Intensity: 7.9 drinks/episodes
### Binge Drinking by Sex, U.S. Adults, 2010

<table>
<thead>
<tr>
<th></th>
<th>Prevalence</th>
<th>Frequency (# of episodes)</th>
<th>Intensity (drinks/episode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>23.2%</td>
<td>5.0</td>
<td>9.0</td>
</tr>
<tr>
<td>Females</td>
<td>11.4%</td>
<td>3.2</td>
<td>5.9</td>
</tr>
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</table>
### Binge Drinking by Age, U.S. Adults, 2010

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Prevalence</th>
<th>Frequency (# of episodes)</th>
<th>Intensity (drinks/episode)</th>
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<tbody>
<tr>
<td>18-24</td>
<td>28.2%</td>
<td>4.2</td>
<td>9.3</td>
</tr>
<tr>
<td>25-34</td>
<td>27.9%</td>
<td>4.2</td>
<td>8.4</td>
</tr>
<tr>
<td>35-44</td>
<td>19.2%</td>
<td>4.1</td>
<td>7.6</td>
</tr>
<tr>
<td>45-64</td>
<td>13.3%</td>
<td>4.7</td>
<td>6.8</td>
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<tr>
<td>65+</td>
<td>3.8%</td>
<td>5.5</td>
<td>5.7</td>
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</table>
### Binge Drinking by Race, U.S. Adults, 2010

<table>
<thead>
<tr>
<th>Race</th>
<th>Prevalence (%)</th>
<th>Frequency (# of episodes)</th>
<th>Intensity (drinks/episode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>18.0%</td>
<td>4.4</td>
<td>7.9</td>
</tr>
<tr>
<td>Black</td>
<td>12.7%</td>
<td>4.7</td>
<td>6.8</td>
</tr>
<tr>
<td>Hispanic</td>
<td>17.9%</td>
<td>3.8</td>
<td>8.4</td>
</tr>
<tr>
<td>Other</td>
<td>15.3%</td>
<td>4.7</td>
<td>8.7</td>
</tr>
<tr>
<td>Education Level</td>
<td>Prevalence</td>
<td>Frequency (# of episodes)</td>
<td>Intensity (drinks/episode)</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------</td>
<td>---------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>&lt; High School</td>
<td>13.7%</td>
<td>5.5</td>
<td>9.3</td>
</tr>
<tr>
<td>High School</td>
<td>17.6%</td>
<td>4.7</td>
<td>8.2</td>
</tr>
<tr>
<td>Some College</td>
<td>19.0%</td>
<td>4.1</td>
<td>7.6</td>
</tr>
<tr>
<td>College</td>
<td>18.2%</td>
<td>3.4</td>
<td>6.9</td>
</tr>
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</table>
### Binge Drinking by Income, U.S. Adults, 2010

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Prevalence</th>
<th>Frequency (# of episodes)</th>
<th>Intensity (drinks/episode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$25,000</td>
<td>16.2%</td>
<td>5.0</td>
<td>8.5</td>
</tr>
<tr>
<td>$25,000-&lt;$50,000</td>
<td>17.9%</td>
<td>4.2</td>
<td>7.9</td>
</tr>
<tr>
<td>$50,000-&lt;$75,000</td>
<td>18.9%</td>
<td>4.4</td>
<td>7.9</td>
</tr>
<tr>
<td>≥$75,000</td>
<td>20.2%</td>
<td>3.7</td>
<td>7.2</td>
</tr>
</tbody>
</table>
Binge Drinking Prevalence and Intensity Varies by State, 2010


<table>
<thead>
<tr>
<th>Measure</th>
<th>1993</th>
<th>2001</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence</td>
<td>14.2%</td>
<td>14.3%</td>
<td>15.2%</td>
</tr>
<tr>
<td>Total Episodes</td>
<td>1.2 billion</td>
<td>1.5 billion</td>
<td>1.7 billion</td>
</tr>
<tr>
<td>Episodes per Person</td>
<td>6.3</td>
<td>7.4</td>
<td>7.1</td>
</tr>
</tbody>
</table>


Binge Drinking among Adults by Age and Survey Mode, U.S., 2009

Kanny D, et al. MMWR, 2010
Prevalence of Past-Year Alcohol Dependency, NM BRFSS, 2002

All Respondents

- Dependent: 2%
- Non-Dependent: 98%

Binge Drinkers

- Dependent: 8%
- Non-Dependent: 92%

Current Drinking by Sex, High School Students, YRBS, 1991-2011

Current Alcohol Use - students who had at least one drink of alcohol on at least 1 day during the 30 days before the survey; Current Binge Drinking - students who had five or more drinks of alcohol in a row, that is, within a couple of hours, on at least 1 day during the 30 days before the survey.
Binge Drinking by Sex, High School Students, YRBS, 1991-2011

Current Alcohol Use - students who had at least one drink of alcohol on at least 1 day during the 30 days before the survey;
Current Binge Drinking - students who had five or more drinks of alcohol in a row, that is, within a couple of hours, on at least 1 day during the 30 days before the survey
Chronic Disease Indicators (CDI)

- Collaboration between CDC, CSTE, and NACDD
  - Consensus process
  - Uniform, comprehensive indicator definitions
- Data collected and reported by CDC
  - States
  - Large metropolitan areas
- Reviewed for update in 2012-13
  - Topic-specific working groups, including alcohol
  - Subject matter experts from states and CDC
  - Recommend changes, additions, or deletions
Changes Relevant to Alcohol

- Separation of “Tobacco and Alcohol Use”
  - Alcohol
  - Tobacco
- Additional indicators for alcohol use
- New system and environmental indicators
## Alcohol Indicators (proposed)

<table>
<thead>
<tr>
<th>Name</th>
<th>Existing or New Indicator</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol use among youth</td>
<td>Existing</td>
<td>YRBSS</td>
</tr>
<tr>
<td>Binge drinking prevalence among youth</td>
<td>Existing</td>
<td>YRBSS</td>
</tr>
<tr>
<td>Binge drinking prevalence among adults aged ≥ 18 years</td>
<td>Existing</td>
<td>BRFSS</td>
</tr>
<tr>
<td>Binge drinking prevalence among women of childbearing age</td>
<td>Existing</td>
<td>BRFSS</td>
</tr>
<tr>
<td>Binge drinking prevalence before pregnancy</td>
<td>New</td>
<td>PRAMS</td>
</tr>
<tr>
<td>Binge drinking frequency among adults aged ≥ 18 years</td>
<td>New</td>
<td>BRFSS</td>
</tr>
<tr>
<td>Binge drinking intensity among adults aged ≥ 18 years</td>
<td>New</td>
<td>BRFSS</td>
</tr>
<tr>
<td>Heavy drinking among adults aged ≥18 years</td>
<td>Revised</td>
<td>BRFSS</td>
</tr>
<tr>
<td>Heavy drinking among women of childbearing age</td>
<td>New</td>
<td>BRFSS</td>
</tr>
<tr>
<td>Chronic liver disease mortality</td>
<td>Existing</td>
<td>Vital statistics</td>
</tr>
<tr>
<td>Per capita alcohol consumption among persons aged ≥ 14 years</td>
<td>New</td>
<td>AEDS</td>
</tr>
<tr>
<td>Amount of alcohol excise tax by beverage type</td>
<td>New</td>
<td>APIS</td>
</tr>
<tr>
<td>Commercial host (dram shop) liability for alcohol service</td>
<td>New</td>
<td>Legal research</td>
</tr>
<tr>
<td>Local control of the regulation of alcohol outlet density</td>
<td>New</td>
<td>Legal research</td>
</tr>
<tr>
<td>Alcohol use before pregnancy</td>
<td>New</td>
<td>PRAMS</td>
</tr>
</tbody>
</table>
Resources
Alcohol and Public Health

Excessive alcohol use, including underage drinking and binge drinking (drinking 5 or more drinks during a single occasion for men or 4 or more drinks during a single occasion for women), can lead to increased risk of health problems such as injuries, violence, liver diseases, and cancer. The CDC's Alcohol Program works to strengthen the scientific foundation for preventing excessive alcohol use. Program Overview

Alcohol and Public Health Topics

- Frequently Asked Questions (FAQs)
  - Introduction to alcohol, drinking levels, excessive alcohol use...
- Additional Resources
  - Other Alcohol-related CDC Programs, Federal Agencies, Professional and Nonprofit Organizations
- Online Applications
  - Alcohol-Related Disease Impact (ARDI)
- Fact Sheets
  - Binge drinking, Underage drinking, Alcohol Use and Health...
- Public Health Surveillance
  - Data, Trends, and Maps, Behavioral Risk Factor Surveillance System (BRFSS), Youth Risk Behavior Surveillance System (YRBS)
- Public Health Objectives and Guidelines
  - Healthy People 2020, Chronic Disease Indicators, Dietary Guidelines for Americans 2010
- Publications
  - Vital Signs, Scientific Studies...
- About Us
  - CDC's Alcohol Program, CDC-funded

Featured Items

- CDC.gov Web Feature, Excessive Drinking Costs the United States $223.5 Billion in 2006. Learn about the high price of alcohol consumption.
- Vital Signs Binge Drinking: Nationwide Problem, Local Solutions. See the most recent estimates of how many people binge drink, how often they binge drink, and how many drinks they consume.
- Alcohol-Related Disease Impact (ARDI) software

Popular Links

- Binge Drinking Video
- "Regulating Alcohol Outlet Density: An Action Guide"
- "Youth Exposure to Alcohol Advertising on Television, 2001-2005"

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  Atlanta, GA 30333
- 800-CDC-INFO
  (800) 232-4636
  TTY: (888) 232-6348
  24 Hours/Every Day
  cdcinfo@cdc.gov
Preventing Excessive Alcohol Consumption

Excessive alcohol consumption is the third leading cause of preventable death in the United States and is a risk factor for many health and societal problems. In 2005, the estimated economic cost of excessive drinking in the U.S. was $223.5 billion (Bouchery et al 2011). Approximately 5% of the total population drinks heavily and 15% of the population engages in binge drinking (CDC) 6.

Among adults, excessive consumption can take the form of heavy drinking, binge drinking, or both.

- Heavy drinking is defined as more than two drinks per day on average for men or more than one drink per day on average for women.
- Binge drinking is defined as five or more drinks during a single occasion for men or four or more drinks during a single occasion for women.

Underage drinking can also be considered a form of excessive drinking because it is both illegal and often involves consumption in quantities and settings that can lead to serious immediate and long-term consequences.

- People aged 12 to 20 years drink 11% of all alcohol consumed in the United States. More than 90% of this alcohol is consumed in the form of binge drinks (OJJDP) 8.

Task Force Recommendations & Findings

This table lists interventions reviewed by the Community Guide, with Task Force findings for each (definitions of findings). Click on an underlined intervention title for a summary of the review.

<table>
<thead>
<tr>
<th>Interventions directed to the general population</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dram shop liability</td>
<td></td>
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</tbody>
</table>
Conclusions

- Excessive alcohol use is common and is associated with a wide range of health and social problems.

- Routine assessment of outcome and consumption indicators are key.
Acknowledgments

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Marissa Esser

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YRBS Staff & Coordinators
Community Guide
Center on Alcohol Marketing and Youth
Community Anti-Drug Coalitions of America
State Alcohol Epidemiologists

Funding Alcohol Epidemiologists in New Mexico and Michigan

- Public health surveillance, including the assessment of alcohol outlet density
- Developing partnerships with other programs and community groups
- Planning and evaluating effective population-based interventions