Epidemiology of Alcohol Problems
In the United States

NIAAA Social Work Education
Module 1
(revised 03/04)
Objectives

A. Describe demographic characteristics and historical trends of alcohol use, alcohol abuse/dependence and other alcohol-related problems

B. Identify the relationship between level of alcohol consumption and health effects

C. Recognize the implications of utilizing epidemiological data for early intervention and prevention of alcohol problems, and for evaluating intervention impact
Epidemiologic Rates

- **Incidence Rate** = The rate at which **new** cases occur in a population during a specific period (e.g., over one year)

- **Prevalence Rate** = The proportion of cases that **exist** in a population at a point in time
Epidemiologic Approach to Alcohol Problems

- An ecological model
- Addresses etiology, natural history
- Identifies interaction of vulnerability, risk, and resilience factors
- Study of alcohol use, abuse, and dependence in communities, populations
Differing Measures across Studies

“New Case” can be defined as:

- Age or year of first use or first intoxication
  versus
- Age of onset of alcohol dependence (age of first experience of any clinical criterion symptoms for diagnosis)
  versus
- Age of occurrence of the third dependence symptom or age when symptoms first “cluster” (2 or more symptoms in a year)
### Standard Drink Measure

<table>
<thead>
<tr>
<th>12 oz. of beer or cooler</th>
<th>8-9 oz. of malt liquor</th>
<th>5 oz. of table wine</th>
<th>3-4 oz. of fortified wine</th>
<th>2-3 oz. of cordial, liqueur, or aperitif</th>
<th>1.5 oz. of brandy</th>
<th>1.5 oz. of spirits</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 oz.</td>
<td>8.5 oz.</td>
<td>5 oz.</td>
<td>3.5 oz.</td>
<td>2.5 oz.</td>
<td>1.5 oz.</td>
<td>1.5 oz.</td>
</tr>
</tbody>
</table>

*Note:* People buy many of these drinks in containers that hold multiple standard drinks. For example, malt liquor is often sold in 16-, 22-, or 40 oz. containers that hold between two and five standard drinks, and table wine is typically sold in 25 oz (750 ml.) bottles that hold five standard drinks.
Defining Alcohol Consumption

• Prior to 1970, per capita consumption =
  total alcohol beverage sales
  total population over age 15 years

• Since 1970, per capita consumption =
  total alcohol beverage sales
  total population over age 14 years

• The 1997 per capita consumption was 2.18 gallons of ethanol per person
Defining Alcohol Consumption

• Prior to 1970, per capita consumption = total alcohol beverage sales / total population over age 15 years

• Since 1970, per capita consumption = total alcohol beverage sales / total population over age 14 years

• The 1997 per capita consumption was 2.18 gallons of ethanol per person
Drinking Patterns (Defined according to quantity & frequency of alcohol consumption)

- **Abstainer**: has never drank or drinks < once/yr
- **Less Frequent**: drinks 1-3 times/month and may or may not drink 5 or more drinks at least once/yr
- **Frequent**: drinks at least once a week and may or may not drink 5 or more drinks at one sitting
- **Frequent Heavy Drinker**: drinks at least once a week and has 5 or more drinks at one sitting at least once per week
A drinking “binge” is a pattern of drinking that brings blood alcohol concentrations (BAC) to 0.08 or above.

- Typical adult males: 5 or more drinks in about 2 hours
- Typical adult females: 4 or more
- For some individuals, the number of drinks needed to reach “binge” level BAC is lower
Drinking Episodes Defined
(National Household Survey)

- **Binge Drinking** as 5 or more drinks per occasion
- **Heavy alcohol use** as 5 or more drinks for 5 or more days per month
Drinking Episodes Defined (NIAAA Advisory Council Task Force)

• Binge drinking is distinct from:
  • “risky” drinking (reaching a peak BAC between .05 gm% and .08 gm%)
  • a “bender” (2 or more days of sustained heavy drinking)
Drinking Episodes Defined
(NIAAA Advisory Council Task Force)

- People with risk factors for the development of alcoholism have increased risk with any alcohol consumption, even that below a “risky” level.
- For pregnant women, any drinking presents risk to the fetus.
- Drinking by persons under the age of 21 is illegal.
- “Binge drinking is clearly dangerous for the drinker and society.”
**At Risk or Problem Use**

- Drinking above established cut-off limits
  
  **AND**

- No current problems associated with drinking

  **OR**

- Alcohol use in risky situations
**Definition of Alcohol Abuse**

Maladaptive alcohol use causes clinically important distress or impairment, shown in a single 12-month period by one or more of the following:

| • Failure to carry out major obligations at work, home or school because of repeated alcohol use | • Repeated experience of legal problems |
| • Repeated use of alcohol even when it’s physically dangerous to do so. | • Continued alcohol use despite knowing that it has caused or worsened social or interpersonal problems |
**Definition of Alcohol Abuse**

Maladaptive alcohol use causes clinically important distress or impairment, shown in a single 12-month period by one or more of the following:

<table>
<thead>
<tr>
<th>• Tolerance or withdrawal</th>
<th>• Reducing or abandoning important work, social or leisure activities because of alcohol use.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Amount/duration of use greater than intended.</td>
<td>• Continued alcohol use despite knowing that it has probably caused ongoing physical or psychological problems</td>
</tr>
<tr>
<td>• Unsuccessful efforts to control or reduce use</td>
<td></td>
</tr>
<tr>
<td>• Spending much time using alcohol, recovering from its effects, or trying to obtain it.</td>
<td></td>
</tr>
</tbody>
</table>

NIAAA
Historical Trends: 1850-1997

Source: Nephew et al., 1999
Prevalence of Lifetime Alcohol Use by Age and Gender
National Trends

[Bar chart showing liters of ethanol consumed in different countries (Australia, Canada, France, Germany, U.K., Japan, U.S.) for the years 1970, 1980, and 1990. Source: NIAAA, 1997a]
Prevalence of Lifetime Alcohol Use by Age and Gender
Age Trends: Heavy Use in Past 30 Days

Source: Johnston et al., 1998
Age Trends: Intoxication

Source: Johnston et al., 1998
Prevalence of Lifetime Alcohol Dependence (DSM-IV)

Source: SAMHSA, 2000a
Prevalence of Alcohol Use (Men) and Dependence by Age
Prevalence of Alcohol Use (Women) and Dependence by Age
### Alcohol Use & Aging Populations

<table>
<thead>
<tr>
<th>National Household Survey on Drug Abuse, 2000</th>
<th>Community sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6% of elders report heavy drinking in past 30 days</td>
<td>2.2 to 9.6% of elders abuse alcohol</td>
</tr>
<tr>
<td>Aging primary care patients</td>
<td>Hospitalized adults &gt;40:</td>
</tr>
<tr>
<td>15% male, 12% female abuse alcohol</td>
<td>21% abused alcohol</td>
</tr>
<tr>
<td></td>
<td>SAMHSA TIP Series, ‘98</td>
</tr>
<tr>
<td></td>
<td>Up to 17% of older adults are affected by alcohol and prescription drug problems</td>
</tr>
</tbody>
</table>
Additional Risks Related to Alcohol Use and Aging

• Elderly individuals are more likely to be affected by chronic illness and use of medications.

• Alcohol and prescription drug problems are frequently:
  Under-identified         Under-diagnosed
  Under-treated           Under-estimated
Age and Gender Interactions

Source: SAMHSA, 1999a
Past Month Alcohol Use by Ethnicity: Ages 18-25

Source: SAMHSA, 1999a
Past Month Alcohol Use by Ethnicity: Age 26 or Older

Source: SAMHSA, 2000a
Use of Alcohol and Other Drugs: 1999 Ages 18-25

Source: SAMHSA, 2000a
Use of Alcohol and Other Drugs: 1999 Ages 26 and Older

Source: SAMHSA, 2000a
Reported Past Year Substance Dependence by Age, 1999

Source: SAMHSA, 2000a
## Adolescent Risk Factors

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Increased Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Negative interaction with mother</td>
<td>• 1.6 – 4.6</td>
</tr>
<tr>
<td>• Negative interaction with father</td>
<td>• 1.7 – 4.0</td>
</tr>
<tr>
<td>• Parental alcohol dependence</td>
<td>• 2.52</td>
</tr>
<tr>
<td>• Parents dislike friends</td>
<td>• 3.71</td>
</tr>
<tr>
<td>• Heavy drinking friends</td>
<td>• 15.5</td>
</tr>
<tr>
<td>• Daily cigarette smoking</td>
<td>• 15.8</td>
</tr>
</tbody>
</table>

Source: Kuperman et al., 2001
### Adolescent Risk Factors (continued)

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Increased Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marijuana abuse</td>
<td>27.1</td>
</tr>
<tr>
<td>Other drug abuse</td>
<td>19.8</td>
</tr>
<tr>
<td>Dropping out of school</td>
<td>6.5</td>
</tr>
<tr>
<td>ADHE</td>
<td>5.0</td>
</tr>
<tr>
<td>Conduct disorder</td>
<td>13.5</td>
</tr>
</tbody>
</table>

Source: Califano and Booth, 1998
Problems Reported by Alcohol Users (past year)

Source: SAMHSA, 1999a
Alcohol and Violence

1. Alcohol is related to both aspects of violence -- perpetration and victimization

2. Offenders were drinking in:

- 86% of homicides
- 60% of sexual offences
- 37% of assaults
- 27% of females and 57% of males involved in marital violence
- 13% of child abuse cases

Source: Roizen, 1997)
## Alcohol and Violence (continued)

<table>
<thead>
<tr>
<th>Source</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roizen, 1993</td>
<td>- 13%-50% of offenders in rape cases</td>
</tr>
<tr>
<td></td>
<td>- 6%-36% of victims in rape cases</td>
</tr>
<tr>
<td>Miczek et al., 1993</td>
<td>- 35%-65% of rape cases (6 studies)</td>
</tr>
<tr>
<td>Identified alcohol in:</td>
<td>- ~50% of incest cases (2 studies)</td>
</tr>
<tr>
<td></td>
<td>- 20%-83% of family violence cases (3 studies)</td>
</tr>
<tr>
<td></td>
<td>- 10%-83% of homicides (6 studies)</td>
</tr>
<tr>
<td></td>
<td>- 33%-57% of felonies (2 studies)</td>
</tr>
</tbody>
</table>
1. Risk factors for becoming violent:
   - History of violence
   - Multiple drug use
   - Co-morbid psychiatric disorder

2. Rates for alcohol-related violence hard to find:
   - Rates of alcohol involvement vary across studies making comparison difficult
   - Hard to establish a causal relationship due to other factors (e.g., interaction between personality factors and alcohol)
Alcohol, Drug, and Violent Events Related to Arrest

Source: Nunes-Dinis & Weisner, 1997
Alcohol and Drug Use: 12 Months of Arrests in Northern California

Source: Nunes-Dinis & Weisner, 1997
Alcohol–Related Hospitalizations

1. Hospital discharges (1997):

- Alcohol-related diagnosis was first-listed (primary) diagnosis for 20.2 per 10,000 population aged 15 and older
- All listed alcohol-related diagnosis was 64.5 per 10,000 population

2. Alcohol-related morbidity episodes not appearing as a first-listed (primary) diagnosis = 69%
## Alcohol-Related Hospitalizations (continued)

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol dependence syndrome</td>
<td>49 %</td>
</tr>
<tr>
<td>Alcohol psychosis</td>
<td>22 %</td>
</tr>
<tr>
<td>Cirrhosis of the liver</td>
<td>20 %</td>
</tr>
<tr>
<td>Alcohol abuse, nondependent</td>
<td>9 %</td>
</tr>
</tbody>
</table>
Age-Adjusted Liver Cirrhosis Mortality U.S. 1910-1996

Source: Saadatmand et al., 1999
Vulnerability to Alcohol-Related Liver Disease

- Genetic Factors
- Dietary Factors
- Gender
- Hepatitis C
- Level of Alcohol Intake

Source: NIAAA, 2001 b
Alcohol-Related Cirrhosis by Race and Gender (Age-Adjusted, 1996)

Source: Saadatmand et al., 1999.
Alcohol Consumption Among U.S. Pregnant & Child-bearing Aged Women
Frequent Drinking Among U.S. Pregnant & Child-bearing Aged Women

Source: CDC, 1997.
Binge Drinking Among U.S. Pregnant & Child-bearing Aged Women

- **1991**: Percent for Pregnant Women: <1, All Women: 10
- **1995**: Percent for Pregnant Women: 2, All Women: 9
- **1999**: Percent for Pregnant Women: 3, All Women: 18

Sources: SAMHSA, 1999a; CDC, 1997
Reported Rates of Fetal Alcohol Syndrome, U.S. 1979-1993

Source: CDC, 1995a
Prenatal Alcohol Exposure

- How many drinks can a pregnant woman consume without harm to the fetus?

- An estimated 550,000 to 750,000 U.S. children are born exposed to drugs/alcohol each year

- Increased risk of child maltreatment (abuse, neglect) and out of home placement
Risks of Fetal Alcohol Exposure

- Low birth weight
- Prematurity
- Small for gestational age (SGA)
- Failure to thrive (FTT)
- Neurobehavioral symptoms
- Infectious disease

- Sudden Infant Death Syndrome (SIDS)
- Fetal Alcohol Syndrome (FAS)
- Other Fetal Exposure Effects
- Compromised developmental outcomes
Compromised Developmental Outcomes

- Many unknowns to predict specific outcome
- Certain physical problems may persist
- Some problems not immediately apparent
- Secondary problems may emerge
- Structured and nurturing environment may compensate and promote development
- Regular developmental evaluation needed
- Need early identification of social, language, cognitive, and motor developmental problems
Children Prenatally Exposed

Developmental patterns from birth to 15 months characterized by:

- Unpredictable sleep patterns
- Feeding difficulties
- Irritability
- Atypical social interaction
- Delayed language development
- Poor fine motor development

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Children Prenatally Exposed (continued)

Toddlers (16-36 months):
- Atypical social interaction
- Minimal play strategies

Preschoolers (3-5 years):
- Easy loss of control
- Mood swings
- Hyperactivity/short attention span
- Difficulty transitioning between activities
- Difficulty processing auditory/visual info
School aged to adolescence:
• No conclusive research on long-term biological or constitutional effects of drug/alcohol exposure

• Greater risk of maltreatment, learning disabilities, behavior problems
Alcohol Death Rates by Ethnicity (Age-Adjusted), 1979-1997

Source: Hoyert et al., 1999

Source: Hoyert et al., 1999
Age-Adjusted Death Rates for Causes Other Than Cancer, Heart, or Stroke, U.S. (1997)

Source: Hoyert et al., 1999
Age-Adjusted Death Rates by Causes Other than Cancer, Heart, or Stroke, Ages 25-64 (1997)

Source: Hoyert et al., 1999
Age-Adjusted Death Rates by Cause, Ages 24-64 (1997)

Source: Hoyert et al., 1999
Drug Abuse Death 1995-1998

Source: SAMHSA, 2000
Drug-Related Deaths by Age (1996)

Source: SAMHSA, 1997
Alcohol Involvement in Emergency Department Episodes

1. 35% of drug episodes (1999) involved a mention of alcohol-in-combination events.

2. Rate per 100,000:
   - Alcohol in combination: 81
   - Cocaine: 69
   - Marijuana: 36
   - Opiates: 35

Source: SAMSHA, 1999b
# Medical Examiner Mention of Drugs, 6-17 Year Old Decedents (n=124)

<table>
<thead>
<tr>
<th>Category Mentioned:</th>
<th># of mentions</th>
<th>% total episodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marijuana/hashish</td>
<td>52</td>
<td>41.9</td>
</tr>
<tr>
<td>Cocaine</td>
<td>26</td>
<td>21.0</td>
</tr>
<tr>
<td>Alcohol in combination</td>
<td>23</td>
<td>18.6</td>
</tr>
<tr>
<td>Opiates</td>
<td>22</td>
<td>17.7</td>
</tr>
<tr>
<td>Diazepam</td>
<td>10</td>
<td>8.1</td>
</tr>
</tbody>
</table>

Source: SAMSHA, 1997
Traffic Alcohol-Related Fatalities, 1977-1999

Source: Yi et al., 2001
Alcohol Involvement in Accidental Death, Homicide, and Suicide

Source: Smith et al., 1999
Alcohol and Trauma by Injury Type

Source: NIAAA, 1997
Alcohol and Trauma, by Age

Source: NIAAA, 1997
Relative Risk Over 21 Years, Alcohol Consumption & Mortality (Scottish Men)

Alcohol and Mortality: 11-Year Follow-up, Adults Age 50+ (16,304 Danish Men & Women)

Source: Gronbaek et al., 1998
DHHS & USDA Dietary Guidelines for Alcohol Consumption

Women- Moderate drinking, no more than 1 drink/day
Men- Moderate drinking, no more than 2 drinks/day

• Children __________
  Adolescents__________ Should not drink at all
  Pregnant women_____

• Adults Children ______________
  Adolescents_____________ Should not drink
  Pregnant women__________ at all
  Family history of alcoholism
One Day Census of Clients in Substance Treatment by Age
Appendices

Additional Materials Available for Incorporating into Classroom Presentations
Per Capita Consumption, 1935-98

Per Capita Consumption, 1977-98

Per capita ethanol consumption by beverage type, United States, 1977–98.

Percent Changes in Per Capita Consumption, 1977-1998

Total Per Capita Consumption: Ethanol by State, 1997

US total = 2.18
U.S. Drinking Patterns

- Abstain 40%
- Dependent 5%
- At Risk or Problem 20%
- Low Risk 35%

Principal diagnosis of discharges with alcohol mentioned (1997)

- Alcoholic psychoses: 6.8%
- Alcohol dependence syndrome: 15.3%
- Cirrhosis, with mention of alcohol: 3.7%
- Cirrhosis, without mention of alcohol: 2.5%
- Nondependent abuse of alcohol: 3.0%
- Nonalcohol-related first-listed diagnosis: 68.7%
Average deaths with explicit mention of alcohol: 1986-1990