PUBLIC HEALTH STRATEGIES
To Reduce Alcohol-Related Illness, Injury and Death in Milwaukee County

EXECUTIVE SUMMARY

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About This Report

Alcohol is the most widely used psychoactive substance in the United States today. Drinking is so accepted in its social and ceremonial use that it is seldom thought of as a drug with addictive capabilities. However, when consumed in excessive amounts, either during one occasion or chronically over a long period of time, alcohol is as potent and dangerous as many illicit drugs. Similar to other sedative/hypnotic drugs (such as Valium, morphine, and heroin), alcohol affects the central nervous system, slowing down bodily functions such as heart rate/pulse and respiration. Small quantities can produce feelings of well-being and relaxation, but larger quantities can lead to intoxication, sedation, unconsciousness and even death.

In an effort to provide a fuller understanding of alcohol misuse and its effects, this report first provides a summary of the impact of alcohol use and misuse, including myths about alcohol; a description of alcohol and alcoholic beverages; the physiological processing of alcohol; definitions of alcohol use; an overview of alcohol-related illness, injury and death; and an overview of alcohol-related costs and economic problems. The report then discusses a public health approach for reducing alcohol-related illness, injury and death. Finally, the report presents recommendations for developing a comprehensive public health approach to reduce alcohol problems in Milwaukee County.

The present paper is an abbreviated, Executive Summary of a fuller report addressing public health strategies for reducing alcohol problems in Milwaukee County. Data were drawn from national, State of Wisconsin and Milwaukee County sources ranging from governmental reports to professional articles to public interest group publications and Internet sites. A variety of sources were used to represent both the empirical research and the public sentiment and views of the nature and scope of alcohol problems in this county and the local community. It is not the intention of this report, however, to be a comprehensive review of all the complex issues related to alcohol misuse and associated problems.

Impact of Alcohol Use and Misuse

Overview

Nationally, there are over 100,000 alcohol-related deaths annually, making alcohol the third leading cause of death, behind only heart disease and cancer, and the third leading cause of preventable death, behind only tobacco and diet/activity patterns. Use and misuse of alcohol results in premature death to a much greater degree than both heart disease and cancer, shortening life by up to 22 years. Alcohol-related morbidity, with its medical and social effects and related costs, overwhelms individuals, families and health and social systems at the national, state and local levels.

Every year, over four million Americans become new drinkers including 81,000 Wisconsin residents and 14,700 Milwaukee County residents - making alcohol the leading drug of choice ahead of cigarettes, marijuana and other illicit drugs. Unfortunately, many of these new users of alcohol are under the legal drinking age and underage drinking has been shown to be a strong predictor of an alcohol disorder later in life. In addition, alcohol is a common “gateway” drug leading to the use of other illegal substances.

Given that Wisconsin in general and Milwaukee County in particular have a strong historic tradition in the manufacturing and distribution of alcoholic beverages, particularly beer, it is not surprising that excessive alcohol consumption exacts even a larger-than-usual burden on the state’s residents. For example, only 30 percent of Wisconsin residents over the age of 12 abstain from alcohol — lowest of any state in the union. Other notable Wisconsin and Milwaukee County statistics related to alcohol use and misuse include:
• In Wisconsin there are 222 new users of alcohol every day; in Milwaukee County there are about 40 new users of alcohol every day.4
• From 1970 to 1990 Wisconsin, compared to other states, ranked fourth highest in the nation in per capita beer consumption, seventh highest in distilled spirits consumption and 26th highest in wine consumption.1,8
• In 1995 70% of Wisconsinites were drinkers. Of these 5% were classified as heavy drinkers (60 or more drinks per month) and 23% as heavy, episodic (binge) drinkers.3
• 6% of Milwaukee County residents, 58,176 people, engage in chronic drinking.3,9
• 5% of Wisconsin residents, 256,144 people, engage in chronic drinking.3,9
• Wisconsin ranks first among states in the number of liquor licenses issued annually. There were about 16,700 liquor licenses granted in Wisconsin in 1996, with about one for every 308 men, women and children in Wisconsin, and one for every 412 people in Milwaukee County.8,10,11
• Annually, in Wisconsin, the alcohol industry generates $7 billion in business, $40 million in taxes, and 130,000 jobs.12
• Alcohol-related morbidity and mortality cost over $3 billion annually, ranking Wisconsin fifth nationally at $611 for every Wisconsin resident.12

Myths or Assumptions

Table 1 displays a number of myths and erroneous assumptions regarding alcohol as a potentially harmful agent, the effects of alcohol on the person consuming excessive amounts of alcohol, and the efforts at preventing both alcohol misuse and the associated harmful consequences of misuse. This list of myths, of course, is not exhaustive, but these assumptions are indicative of how little is commonly understood about alcohol use and misuse. Also highlighted by these myths is that alcohol problems are diverse and that prevention efforts can be directed at the host, the alcohol as the agent, and at the environmental circumstances in which the host and agent interact.

(See Table 1, page 3)

Description of Alcohol and Alcoholic Beverages

In this report, the term “alcohol” will be used to refer to the more technically known substance “ethyl alcohol” or “ethanol.” Beverages containing alcohol are produced by fermenting or distilling various grains, vegetables or fruits. Ethanol itself is a clear, colorless liquid, beverage alcohol gets its color from additives or the by-products of fermentation. A standard alcoholic beverage is defined for this report as 12 ounces of beer, five ounces of wine, or 1.25 ounces of liquor, each equaling about 28.5 grams ethanol. Typical ethanol content by volume for these beverages is five percent for beer, 10 - 14 percent for wine, and 40 percent for liquor or distilled spirits, with certain beers, wines and liquors being weaker (light beer, for example, is about 3.5 percent ethanol) or stronger (fortified wine or liquor, for example, can be up to 20 to 50 percent ethanol, respectively) than others. Some alcoholic beverages (beer, for example) are classified as food products, however, although it contains calories, it has no other nutritional value.

Physiological Processing of Alcohol and Related Effects

Alcohol is almost invariably ingested orally. It is absorbed rapidly into the bloodstream from the small intestine and less rapidly from the stomach and colon; it is metabolized in the liver. It is a central nervous system depressant that decreases activity in parts of the brain and spinal cord.1,3 Peak Blood Alcohol Concentration (BAC) occurs 45 to 60 minutes after ingestion (less if ingested on an empty stomach), with the rate of metabolism of about two-thirds of a standard drink per hour. BAC is expressed as the number of milligrams of alcohol in each
Table 1. Myths or Assumptions and Facts Regarding Alcohol, Those Who Use and Misuse Alcohol and Efforts to Reduce the Misuse of Alcohol.

<table>
<thead>
<tr>
<th>MYTH</th>
<th>FACT</th>
<th>PAGE(S)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Alcoholism is a unitary disorder</td>
<td>Alcohol disorders reflect a range of use and related consequences, problems and syndromes</td>
<td>5</td>
</tr>
<tr>
<td>2 It’s okay for youth to experiment with alcohol</td>
<td>Early alcohol use in adolescence predicts alcohol dependence later in life</td>
<td>27, 34</td>
</tr>
<tr>
<td>3 Women are less affected by alcohol misuse than men</td>
<td>Women have special behavioral and biological problems related to alcohol use</td>
<td>32, 37</td>
</tr>
<tr>
<td>4 All prevention programs work equally well for everyone</td>
<td>Prevention efforts need to be tailored to special populations related to age, gender, race/ethnicity and degree of problem</td>
<td>34</td>
</tr>
<tr>
<td>5 Alcohol is evil and alcohol use is wrong</td>
<td>Excessive alcohol use is wrong and exacts huge personal and social health problems and costs</td>
<td>5, 8, 14</td>
</tr>
<tr>
<td>6 Hard liquor is more harmful than beer or wine</td>
<td>Alcohol is alcohol is alcohol</td>
<td>2</td>
</tr>
<tr>
<td>7 The only way to reduce the harmful effects of alcohol is to reduce consumption</td>
<td>A number of host, agent and environmental efforts irrespective of alcohol use can be used to reduce the harm related to alcohol use</td>
<td>34, 38, 40</td>
</tr>
<tr>
<td>8 Warning labels on alcoholic beverages alone reduces alcohol misuse</td>
<td>People must be aware of these labels and media-based awareness programs increase the effect of these warning labels</td>
<td>39</td>
</tr>
<tr>
<td>9 Individuals should be able to make their own decisions regarding alcohol use</td>
<td>When harm is done to other people as a result of misuse the problem is a public health concern</td>
<td>14, 24</td>
</tr>
<tr>
<td>10 Excise taxes on alcoholic beverages more than pays for the consequences of its misuse</td>
<td>The cost and burden of alcohol misuse far exceeds the taxes and economic benefits of its production and distribution</td>
<td>23, 40</td>
</tr>
<tr>
<td>11 The .100 minimum BAC level for drinking and driving is set too low</td>
<td>Actually, cognitive, emotional and physical effects develop as low as .02 and driving impairment is seen at .08 BAC</td>
<td>4, 42</td>
</tr>
<tr>
<td>12 Alcohol advertisements are designed only for current adult drinkers</td>
<td>Alcohol advertisements have an influence on all individuals including youth</td>
<td>44</td>
</tr>
</tbody>
</table>

* These page numbers refer to the pages the myths are addressed in the full report also published by the Milwaukee Academy of Medicine.
deciliter of blood (mg/dL). Levels of BAC depend on a number of factors, including the amount consumed in a given time; the drinker’s size, sex, body build and metabolism; and the type and amount of food in the stomach. Because alcohol passes through the blood-brain barrier, brain alcohol levels are similar to blood alcohol levels. Table 2 lists varying BAC levels and the corresponding cognitive, emotional and physiological effects.

With regular drinking people can become tolerant of the unpleasant effects of alcohol and thus drink more before suffering these same effects. However, because alcohol is an addictive substance, the removal of alcohol or abstaining may result in withdrawal symptoms. People can become dependent on alcohol, either psychologically (drinking under certain conditions, drinking to alleviate stress or when depressed) and/or physiologically (drinking to prevent withdrawal symptoms such as sweating, tremors, sleeplessness, convulsions and hallucinations).

### Current Definitions of Alcohol Use and Related Disorders

Consuming alcohol is part of many social and celebratory events. Some studies have suggested that alcohol can even be beneficial to one’s health when consumed at low levels. Not everyone consumes alcohol and many individuals use alcohol responsibly and sensibly. Others, however, use alcohol excessively or in high-risk situations, and still others drink chronically or are dependent on alcohol.

The National Institute on Alcohol Abuse and Alcoholism provides physician guidelines for categorizing levels of alcohol consumption, and the American Psychiatric Association provides diagnostic guidelines for alcohol disorders. Taken together, alcohol consumption and problems categorization includes a range of patterns including low-risk drinking, at-risk drinking, alcohol abuse (such as binge or heavy episodic drinking, hazardous or nonresponsible drinking) and alcohol dependence or alcoholism. Table 3 summarizes these alcohol con-

<table>
<thead>
<tr>
<th>BAC LEVEL (mg/dl)</th>
<th>TYPE OF IMPAIRMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>.01</td>
<td>Divided attention; choice reaction time compromised; visual dysfunction</td>
</tr>
<tr>
<td>.02</td>
<td>Impaired tracking and equilibrium</td>
</tr>
<tr>
<td>.03</td>
<td>Impaired eye movement control; standing unsteadiness; quick response difficult</td>
</tr>
<tr>
<td>.04</td>
<td>Impaired coordination</td>
</tr>
<tr>
<td>.05</td>
<td>Mild intoxication; feeling flushed; impaired judgment; decreased inhibitions</td>
</tr>
<tr>
<td>.08</td>
<td>Impaired concentrated attention; increased impaired coordination</td>
</tr>
<tr>
<td>.100</td>
<td>Obvious intoxication in most; increased impairment of judgment, inhibition, attention and control; some impairment of muscular performance and comprehension loss</td>
</tr>
<tr>
<td>.150</td>
<td>Obvious intoxication in most; staggering gait and other muscular incoordination; slurred speech; double vision; memory and comprehension loss</td>
</tr>
<tr>
<td>.250</td>
<td>Extreme intoxication or stupor; reduced response to stimuli; inability to stand; vomiting; incontinence; sleepiness</td>
</tr>
<tr>
<td>.350</td>
<td>Coma; unconsciousness; little response to stimuli; incontinence; low body temperature; poor respiration; fall in blood pressure; clammy skin</td>
</tr>
<tr>
<td>.500</td>
<td>Death likely</td>
</tr>
</tbody>
</table>

Note: .100 g/dl indicates that alcohol makes up one-tenth of one percent of the person’s blood.

sumption and diagnostic categories. Typically, these alcohol classifications are determined by a combination of alcohol consumption and alcohol-related problems criteria to determine an individual’s status. Recently, researchers have reviewed the literature on alcohol consumption classification strategies and have recommended a clinically and empirically-based classification.

<table>
<thead>
<tr>
<th>Table 3. Alcohol Consumption and Disorder Classifications Using Consumption and Problems Domains.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ALCOHOL DISORDER CLASSIFICATION</strong> <em>(Continuum of Severity – Negative to Positive for Disorder)</em></td>
</tr>
<tr>
<td><strong>DOMAIN</strong></td>
</tr>
<tr>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Consumption</td>
</tr>
<tr>
<td>Men: &lt;3 drks/day</td>
</tr>
<tr>
<td>Over 65: &lt;2 drks/day</td>
</tr>
<tr>
<td>Problems</td>
</tr>
<tr>
<td>Problems</td>
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<td>Problems</td>
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<td>Problems</td>
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</tbody>
</table>

**Alcohol-Related Illness, Injury and Death**

There are over 100,000 alcohol-related deaths annually, making it the third leading cause of death behind heart disease and cancer, and the third leading cause of preventable death behind only tobacco and diet/activity patterns. Excessive alcohol use robs individuals of valuable years of life, causing premature death to a much greater degree than both heart disease and cancer. Regular, heavy consumption of alcohol can result in undesirable health problems for most individuals. Even low-to-moderate consumption of alcohol can be desirable or undesirable depending on the characteristics and health status of the individual consuming the alcohol. The health and social consequences of excessive alcohol consumption includes personal illness, altered role functioning (with family, friendships and work), and intentional and unintentional deaths and injuries. Figure 1 graphically summarizes the individual and social consequences of excessive alcohol use.
In terms of alcohol-related illness, the biological effects of alcohol use are so diverse that few biological systems (digestive, endocrine, neurologic, cardiovascular/respiratory, immune, skeletal) or organs (liver, pancreas) are unaffected by excessive or chronic alcohol use. The deleterious effects of alcohol use can arise from both short and long-term use, and they range from cognitive impairment to lesser-known consequences (such as malnutrition and alcohol-drug interactions) to alcohol liver cirrhosis.

In Wisconsin about 30 percent of all people (about 24 percent under age 65 and fully 78 percent 65 or older) reported at least one chronic health condition (such as arthritis, high blood pressure, heart disease, cancer or stroke), some of which are associated with or aggravated by alcohol use and misuse. In Milwaukee County a slightly higher percentage, about 31 percent of all people (about 26 percent under age 65 and fully 77 percent 65 or older), reported at least one chronic health condition, again, some of which are associated with or aggravated by alcohol use and misuse.

With respect to alcohol-related deaths, Table 4 categorizes deaths due to alcohol into direct causes (such as cirrhosis of the liver, dependence syndrome, alcohol abuse and excessive blood level of alcohol), five common indirect causes due to disease (such as tuberculosis, cancer of the throat or oral cavity and diabetes), and four common indirect causes due to injury (such as motor vehicle crashes, falls, homicides and suicides).
Each year, alcohol contributes to about 35 deaths for every 100,000 people in the United States. These estimates translate into approximately 100,000 U.S. citizens dying from alcohol annually, with about 1,800 Wisconsin and 325 Milwaukee County alcohol-related deaths per year.

These 35 deaths per 100,000 can be categorized into about seven deaths per 100,000 due directly to alcohol, 10 indirect alcohol deaths per 100,000 due to disease and 18 indirect alcohol deaths per 100,000 due to injury. Therefore, for Milwaukee County, there are about 65 direct, 95 indirect deaths due to disease and about 165 indirect deaths due to injury. Of the 165 deaths due to injury indirectly caused by alcohol, about 92 (56 percent) are accidents, mostly drunk driving, 43 (25 percent) are homicides, and 31 (19 percent) are suicides. Figure 2a illustrates the types of deaths attributed to alcohol and the number of deaths per 100,000 people in the U.S. Also Figure 2b provides the estimated number of direct and indirect deaths in Milwaukee County for 1996.
Figure 2a. Proportion of Direct and Indirect Alcohol-Related Deaths.

51% Indirect Causes – Injury (18 per 100,000)
20% Direct Causes (7 per 100,000)
29% Indirect Causes – Disease (10 per 100,000)

Figure 2b. Estimated Numbers of Direct and Indirect Alcohol-Related Deaths in Milwaukee County (35 per 100,000 residents).

Alcohol-Related Costs and Economic Problems

The ways in which the financial costs of alcohol abuse and alcoholism are characterized varies depending on the components of the costs provided in the estimates. For example, in 1990 the total direct cost of alcohol abuse in the United States, estimated at 98.6 billion dollars, was greater than the costs for both tobacco abuse (72 billion) and other drug abuse (66.9 billion). Although actual figures are not yet available, recent estimates projected the direct costs of alcohol abuse in 1995 to be about $125 billion. Further, recent estimates suggest that both direct and indirect costs associated with alcohol-related traffic crashes alone costs the U.S. about $148 billion annually representing $1.09 in costs for each drink consumed.

For Wisconsin, on the benefit side of the cost-benefit equation, the alcohol industry is tremendously important to the state’s economy. For example:

- The Tavern League of Wisconsin estimates the total economic contribution of the alcohol industry at $7.1 billion dollars, providing over 130,000 job and rivaling agriculture and tourism as the state’s top industry.

- Miller Brewing Company (the second largest brewery behind Anheuser-Busch) and other Wisconsin breweries produced 12.6 million barrels of beer in 1995.

- Wisconsin consumers spent about $1.3 billion dollars on beer alone in 1995.

- Miller Brewing Company alone employs 1,200 Wisconsin residents, translating into about $158 million in payroll alone and nearly $45 million in state and local taxes annually.

On the other side of the cost-benefit equation is how costly alcohol consumption is to State of Wisconsin and its tax-paying residents. For example, in terms of money spent on alcohol and the economic toll of alcohol problems on Wisconsin residents:

- Alcohol problems cost the state $3 billion each year for prevention and treatment, amounting to about $611 per Wisconsin resident, ranking the state fifth nationally.

- Alcohol-related crashes cost Wisconsin about $489 million in 1995, about 18% of the total economic loss due to automobile crashes.

The heavy cost burden on Wisconsin residents for alcohol-related problems is not alleviated by current Wisconsin excise taxes on alcoholic beverages. In fact, Wisconsin ranks fortieth out of the 50 states in total taxes collected on alcohol sold.
A Public Health Approach for Reducing Alcohol-Related Illness, Injury and Death

Toward a Continuum of Prevention and Intervention Services

Historically the term “alcoholism,” or referring to people as “alcoholics,” reflected the general perception that having an alcohol problem was an all-or-nothing, unitary disorder requiring specialized, abstinence-based interventions. However, more recently, alcohol disorders have been seen as reflecting a range of use and related consequences, problems and syndromes.

As shown in Figure 3, the largest proportion of individuals (about 75 percent) either abstain (33 percent) or drink light-to-moderate amounts (42 percent), with about 20 percent consuming substantial amounts of alcohol, and about 5 percent drinking heavily.31 Furthermore, for those who drink, there is a corresponding increased degree and severity of alcohol-related problems occurring with increased amounts of consumption.

Figure 3. Continuum of Alcohol Consumption and Problems and Associated Prevention and Intervention Services Required for Abuse and Dependence Disorders.

Concurrently, there has been a basic conceptual shift in the past 30 years regarding the provision of health services for alcohol misuse, with greater emphasis being placed on: (1) “alcohol-related problems” rather than on “alcoholism;” (2) the larger numbers of individuals experiencing diverse health consequences of alcohol misuse such as trauma resulting from binge drinking rather than merely on the chronic health problems from longer-term drinking; and (3) alcohol control policy as a prevention strategy targeted at larger numbers of people rather than on intervention with the chronic alcoholic.\textsuperscript{32,33} Figure 3 displays this services continuum in relation to the proportion experiencing alcohol consumption and problems. A larger proportion of people potentially benefit from broad-based, primary prevention programs, others benefit from brief intervention or secondary prevention techniques and the fewest would benefit from specialized services or direct intervention approaches.

**The Public Health Model of Prevention**

Similar to other diseases or behavioral disorders, the misuse of alcohol warrants a public health approach to identify and categorize strategies for reducing or preventing problems.\textsuperscript{32,34,35} As displayed in Figure 4, the public health model specifies three interrelated factors (the host, the agent/vehicle, and the environment) that identify and focus strategies to reduce and/or prevent illness, injury and death due to alcohol misuse.

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure4}
\caption{Interrelationship of Host, Agent/Vehicle and Environment Characteristics in Preventing or Reducing Alcohol Problems.}
\end{figure}

Table 5 lists in detail the variety of characteristics of the host, agent/vehicle and environment factors that could be targeted for alcohol prevention and control efforts.34,35,36,37,38 Briefly, the host refers to the person who consumes the alcohol and the characteristics of that person, such as demographics (age, sex, race, education), experiential and maturational factors (family history of alcohol use, personal experiences with alcohol) and co-existing physical and psychological health factors (diabetes, depression, anxiety, etc.). Also included in the definition of the host are those environments influenced directly or indirectly by the host’s use of the agent (such as school or work environments). The agent refers to the alcohol itself and corresponding characteristics (such as ethanol content, amount ingested, addictive substance and its toxic effects on the physiological and psychological functioning) whereas the vehicle refers to the type of beverage (such as beer, wine or spirits), the container, and the route of substance administration. The public health environment of alcohol use refers to the factors in the social and physical context that might serve as enablers or inhibitors to alcohol use and misuse. These factors would include social acceptance of alcohol use, ease of distribution, access and availability of alcohol with respect to price and taxation, alcohol advertising in the media and laws and activist group influences.

| Table 5. Dimensions of Host, Agent/Vehicle and Environment in Preventing Alcohol Problems. |
|---|---|---|
| **HOST** | **AGENT/VEHICLE** | **ENVIRONMENT** |
| • Intensity and duration of ingestion of alcohol (per episode and across the lifespan) | • Energy and intoxicating effects | • Access and availability (formal and informal) |
| • Episodic or daily drinking pattern | • Highly addictive | • Pricing and taxation |
| • Body size (height, weight) | • Percent ethanol carried by beverage | • Regulations and laws |
| • Gender (women vs. men) | • Type of alcoholic beverage (e.g., beer, wine, liquor) | • Community and societal attitudes |
| • Age and developmental level (Youth, Elderly) | • Packaging of beverage (e.g., wide mouth cans, small breakage bottles, number of ounces) | • Media advertising |
| • Member of vulnerable group (Ethnic minority, young males, college student) | • Warning labels | • Program funding |
| • Comorbid physical or psychiatric problems | | |
| • Real and perceived risk (experience, history, high risk situations, contraindications of use, etc.) | | |

Host Characteristics and Prevention Strategies

Relative to Milwaukee County, the host is determined differently depending on the type of prevention or control strategy used. The host for preventing the use and misuse of alcohol would be all 931,242 residents of Milwaukee County. For strategies to control the misuse of alcohol, the host would be the 651,869 residents who consume alcohol. Finally, the host for targeting strategies for the reduction of alcohol use and misuse would be the estimated 139,687 binge drinkers, of whom about 46,562 to 58,176 are heavy or chronic users of alcohol (depending on different definitions from different data sources).39

Age, gender, race or ethnicity, and education are four primary demographic characteristics to be considered in targeting prevention strategies to the host. Based on typical Milwaukee County census estimates, approximately 210,000 youth would benefit from primary prevention efforts as well as 130,000 persons over the age of 65. About 500,000 women and 250,000 minority residents would benefit from specialized prevention services targeted specifically to these special populations.39,40,41

Focusing on Milwaukee youth, in a recent survey of 18,530 Milwaukee Public School students in middle and high school, a number of questions were asked regarding the problems or concerns related to alcohol misuse.42 The survey indicated that beer and wine were never used by 59 percent of the students, with about 21 percent not using in the past six months, 11 percent using about once a month, five percent using once a week, two percent using several times a week and two percent using every day. Liquor was used less frequently, with 72 percent never using liquor, about 13 percent not using in the past six months, 8 percent using about once a month, four percent using once a week, two percent using several times a week, and two percent using every day.

Furthermore, Milwaukee students reported fairly high levels of concern and or problems related to alcohol (and other drugs):

- 7% felt concerned over their own use of alcohol or other drugs (19% of the boys, 16% of the girls).
- 18% felt pressured into using alcohol, marijuana or other drugs.
- 14% were personally affected by people at home using alcohol.

Table 6 summarizes a number of risk factors for alcohol (and other drug) misuse broadly classified into demographic, family, social, genetic, psychiatric and behavioral categories.43 Presence of these factors do not necessarily mean alcohol problems will develop nor does absence of these factors mean an individual will not develop problems.

(See Table 6 on page 14)

Prevention strategies that are aimed at individuals or the specific environments in which certain types of individuals function are varied. They range from large, school-based programs targeted to youth to prevent the initiation of alcohol use to smaller, secondary prevention strategies implemented in formal and informal health and social settings. They also differ in how they conceptually approach the problems related to alcohol use and misuse. Historically, prevention research has focused more on reducing or eliminating the risk or adverse factors facing today’s youth. Alternatively, more recent research is focusing on compensating for these risk factors through resiliency-enhancing, protective approaches which increases the skills and knowledge for thwarting and protecting youth from developing alcohol problems.44,45
<table>
<thead>
<tr>
<th>Table 6. Risk Factors for Developing Alcohol (and Other Drug) Problems.</th>
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</thead>
<tbody>
<tr>
<td><strong>Sociodemographic</strong></td>
</tr>
<tr>
<td>• Male</td>
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<tr>
<td>• Inner city or rural residence combined with low socioeconomic status; lack of employment opportunities</td>
</tr>
<tr>
<td>• Low self-esteem</td>
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<tr>
<td>• Other mental health disorders (e.g., learning disabilities)</td>
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<tr>
<td>• Feelings of loss of control over one’s life</td>
</tr>
<tr>
<td>• Feelings of loss of control over one’s life</td>
</tr>
<tr>
<td><strong>Family</strong></td>
</tr>
<tr>
<td>• Use of drugs and alcohol by parents, siblings, spouse</td>
</tr>
<tr>
<td>• Family dysfunction (e.g., inconsistent discipline, poor parenting skills, lack of positive family rituals and routine)</td>
</tr>
<tr>
<td>• Family trauma (e.g., death, divorce)</td>
</tr>
<tr>
<td><strong>Social</strong></td>
</tr>
<tr>
<td>• Alcohol- and drug-using peers</td>
</tr>
<tr>
<td>• Social or cultural norms approving use</td>
</tr>
<tr>
<td>• Expectations about positive effects of drugs and alcohol</td>
</tr>
<tr>
<td>• Availability of or accessibility to alcohol and drugs</td>
</tr>
<tr>
<td><strong>Genetic</strong></td>
</tr>
<tr>
<td>• Inherited predisposition to alcohol or drug dependence</td>
</tr>
<tr>
<td>• Deficits in neurotransmitters (e.g., serotonin)</td>
</tr>
<tr>
<td>• Absence of aldehyde dehydrogenase (flushing or palpitations occur when alcohol is ingested)</td>
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</tbody>
</table>

Specific host prevention strategies include:

- School-based programs, including life skills development, resistance education and normative education programs. In Wisconsin these include DARE, FAST and various drug-free schools programs.\textsuperscript{10,13,46}

- Family-oriented prevention programs, such as STAR, that attempt to provide alcohol education for parents and strengthen the family’s role in the positive socialization of children, thus decreasing the likelihood of adolescents deciding to use alcohol.\textsuperscript{47}

- College and university programs that focus on early detection and intervention, not necessarily on primary prevention.\textsuperscript{48,49,50}

- Integrated school and community prevention programs that take a system-wide approach to the prevention of alcohol problems. They involve the student’s immediate environment (family, neighborhood, school, medical care system and community) and the larger environment (media, industry activity, public policy and laws).\textsuperscript{13,25}

- Specialized programs targeting minorities, women and the elderly.\textsuperscript{13,31,32,53,54,55}

- Secondary prevention programs in health and social settings.\textsuperscript{42,48,55,56}

**Agent/Vehicle Characteristics and Prevention Strategies**

Briefly, ethanol is the agent in alcoholic beverages and the vehicle is the container in which the alcohol is stored as well as the label used to identify and promote the use of the alcoholic beverage. Prevention and control strategies addressing the agent/vehicle characteristics of alcohol use and misuse include controlling the ethanol content of alcoholic beverages, manufacturing safer alcoholic beverage containers and putting alcohol warning efforts on labels and in media advertisements. Strategies may be consumption-focused (such as reducing the percent ethanol content) or alcohol-related problem-focused (such as reducing injuries by using special glass that breaks into fine pieces rather than sharp edges).

One Wisconsin and Milwaukee County effort to control both the alcohol content and packaging of alcoholic beverages is the recent legislative proposal (most recent proposed February 18, 1997) to prohibit the sale of malt liquor (which is a fortified beer product) in containers larger than 32 ounces (such as the 40 ounce can sold by Schlitz).\textsuperscript{57} These 40 ounce cans of fortified beer contain the equivalent of almost six 12 ounce cans of regular beer and a little over five glasses of wine or five mixed drinks. This legislation, identified as Wisconsin Assembly Bill 115, has been introduced by State of Wisconsin Representative Morris-Tatum of the City Milwaukee’s 11th Assembly District and co-introduced by Representatives Young, La Fave, and Coggs. The bill proposes penalties of not more than a $500 fine for the first offense, not more than $1,000 fine for the second offense and license to sell alcohol beverages revoked or suspended for the third offense.

**Environmental Characteristics and Prevention Strategies**

Briefly, the environment refers to the ethical, legal, political and social context in which individuals use and misuse alcohol. Both environment-related characteristics and the environment-related strategies used to prevent alcohol misuse are discussed below. These characteristics include economic disincentives (such as taxation and pricing); political legislation and regulations (such as advertising controls, OWI laws, legal drinking age limits and limiting the number of alcohol outlets); formal and informal community attitudes and behaviors related to alcohol access and availability; and program funding practices. These characteristics will be discussed below in the context of a number of economic, political, regulatory, community-based informational or server training strategies which can be used to prevent and control alcohol consumption and related problems.
Economic Disincentive Strategies. Economic issues related to alcohol consumption can be classified into two areas: taxation and pricing. Whether policy-makers focus efforts on increasing prices or increasing excise taxes, the current literature suggests that alcohol beverage consumption follows the economic law of demand; that is, higher prices (or taxes) are associated with lower consumption levels.13 Wisconsin, for example, has the second lowest beer excise tax at $0.06 per gallon (Wyoming has the lowest at $0.02 per gallon), the fifth lowest wine tax at $0.25 per gallon (Louisiana has the lowest at $0.11 per gallon), and the 16th lowest distilled spirits excise tax at $3.25 per proof gallon (the District of Columbia and Maryland have the lowest at $1.50 per proof gallon). For further comparison, Wisconsin is well below State averages for excise taxes on each type of alcoholic beverage, which are about $0.25 for beer, $0.72 for wine, and $3.62 for distilled spirits. Requiring a higher uniform standard excise tax rate for all states may also standardize alcoholic beverage pricing across states and lead to overall reduced consumption nationally.

Other than increasing alcohol excise taxes, little can be done directly by special interest groups or politicians to raise alcohol product prices. Pricing seems to be not only affected by consumer demand for specific alcoholic beverages but also other nonspecific characteristics, such as personal taste and a wide variety of social and cultural determinants. One alternative approach that may get both political and public support would be to initiate a “Nickle a Drink” or a “Dime a Drink” program in the State of Wisconsin and Wisconsin communities. This type of program is an example of raising funds earmarked for education, enforcement, prevention and treatment of alcohol and other substance abuse problems. Funds could be managed by local communities in order to ensure the proportional distribution of funds to these communities.

Alternatively, some informational and server-intervention strategies can be implemented to prevent increased consumption due to lowering prices. For example, servers/servers (such as bartenders and bar and liquor store owners) can be trained to promote higher-priced brands, thereby reducing the quantity of alcohol consumption. Also, servers/owners can be induced to price beverages with lower alcohol content below higher-strength beverages, leading to less consumption of alcohol with comparable fluid intake. In addition, drinking establishments could be induced to avoid “happy hour” and other volume discount promotions.58

Political and Regulatory Strategies. A number of political and regulatory strategies toward limiting the access and distribution of alcohol and its misuse are discussed below.

Number of alcohol outlets. Research has shown that increased alcohol outlet density is related to increased alcohol sales although little is known about precisely what mechanisms are responsible for this relationship.13 Future research is needed to show how individual drinkers respond to changes in the number of alcohol outlets and how light, moderate and heavy drinkers respond differentially to changes in alcohol outlet densities.

Wisconsin ranks first among states in the proportionate number of liquor licenses per resident, with about one for every 305 Wisconsin residents.8,10,11 In 1996 a total of 16,712 liquor licenses (up from 16,648 in 1995) were issued in Wisconsin, with 2,341 licenses in Milwaukee County alone (down from 2,396 in 1996). Of all 72 Wisconsin counties, Milwaukee County ranks 67th in the proportion of residents per liquor license at, 1:412, with Iron, Sawyer and Vilas counties ranking the highest in terms of the number of bars per capita (one for every 51, 72, and 73 residents, respectively) and Waukesha County (Milwaukee County’s neighbor to the west) with the fewest number of bars per capita (with 1 bar for every 516 residents).

Recently, in January 1998, the State of Wisconsin raised the price of obtaining a yearly liquor license from $500 to $10,000. Already there are proposals to allow municipalities to vary this licensure charge according to the demands of community businesses with liquor
licenses. The overall effects of this increase in license cost on the number and distribution of liquor outlets in various municipalities has yet to be determined.

**Raising the minimum drinking age.** Raising the minimum drinking age to 21 is a prevention strategy designed to reduce alcohol availability for adolescents. Wisconsin, for example, changed the legal drinking age from 18 to 19 in 1983 and to 21 in 1985. Research has shown that, among youth, legislation to change the minimum drinking age has been associated with:

- A significant decline in alcohol use.
- Up to a 15% reduction in traffic fatalities.
- Decline in single-vehicle nighttime fatal crashes – most of which involve alcohol.

Under constant political and social debate is whether to decrease the minimum drinking age to less than 21. However, national and state data show that there is a corresponding reduction in alcohol-related motor vehicle deaths when the minimum drinking age is raised. For example, Wisconsin data show that in 1983 and 1984 (the two years prior to the age change from 19 to 21), alcohol-related motor vehicle deaths averaged about 422 annually. They dropped significantly to 373 in 1985 and further to only 335 in 1990 and 282 in 1995. Similar trends in reduced fatalities for Wisconsin residents are found for use of recreational vehicles such as boats, snowmobiles and all-terrain vehicles.

Although a minimum drinking age law does exist for adolescents and young adults, other educational and law enforcement prevention efforts must persist because most underage youth still drink. Locally, for example, in 1995 approximately 37,279 Wisconsin juveniles received convictions or suspensions for underage drinking violations (such as OWI, alcohol purchase, alcohol possession), of which 1,310 juveniles were Milwaukee County residents.

**Drinking and driving programs.** A number of alcohol-related prevention strategies take the form of laws directed at drinking and driving. These strategies include:

- Zero-tolerance and other BAC laws.
- Deterrence methods, such as interlock ignition device, active and visible police enforcement, and swift and certain punishment by the courts.
- Server training and server liability laws.

**Community-Based Programs.** Multifaceted, community-based alcohol prevention programs address the social, political, and economic factors that together encourage or deter alcohol consumption and related problems. Overall, community-based studies have demonstrated effectiveness in terms of awareness and public support for alcohol prevention but not with respect to long-term drinking behavior and related problems. As part of these community prevention programs restrictions on alcohol advertisements in the media (e.g., ban on billboards in Chicago and Baltimore) are effective public health prevention strategies.
Toward a Comprehensive Public Health Approach to Reduce Alcohol Problems in Milwaukee County

Building a Comprehensive, Community Approach

The Milwaukee Academy of Medicine supports a comprehensive, community-wide approach to addressing alcohol problems in Milwaukee County and the greater Milwaukee area. Although existing community programs have had mixed results in terms of drinking behavior (either no change or little change in drinking behavior), these programs have shown consistent effects in community-wide awareness of the effects of excessive alcohol consumption. Figure 5 provides a conceptual model of prevention programming that incorporates multiple players from multiple community institutions. Although the involvement of many individuals and institutions are proposed in this model, it is essential to emphasize the importance of having school officials and students/student organizations assume more of a leadership role in these prevention efforts. Their influence is more important than that of any other community institution.25

Figure 5. Conceptual Model of School-Community Prevention Modeling on Social Environmental, Community, Family, School, Peer and Individuals Levels of Involvement.

Two comprehensive programs, the results of which are not available at this time, propose the administration of more comprehensive community-based prevention strategies. These community-wide programs are attempting to reduce the accessibility of alcohol to youth, encourage responsible beverage service by alcohol outlets, increase enforcement of OWI sanctions, and implement local regulations to reduce alcohol availability.

Similarly, in Milwaukee County, a grass-roots prevention planning committee has formed in an effort to build a comprehensive set of strategies focusing on preventing Milwaukee youth from engaging in alcohol and drug use. The group’s mission is to develop a “Community Wide Substance Abuse Prevention Plan.” The group is led by Fighting Back, Inc. of Milwaukee and includes experts in prevention services, political leaders, law enforcement, alcohol and drug researchers as well as members of the Milwaukee Academy of Medicine’s Public Health Committee. Other community-based programs affiliated with Fighting Back, Inc. are summarized in Table 7.

<table>
<thead>
<tr>
<th>Table 7. Community &amp; Family Alcohol and Other Drug Prevention Programs in Milwaukee County.</th>
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<tbody>
<tr>
<td>National prevalence estimates clearly demonstrate the need to target prevention efforts to Milwaukee’s urban inner city and, in particular, Milwaukee’s Hispanic population.</td>
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<tr>
<td>Fighting Back, Inc. coordinates a number of Milwaukee community and family-based prevention projects targeted at both general and more comprehensive alcohol and drug prevention strategies to promote healthy alcohol use and a drug free lifestyle. Programs include:</td>
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<tr>
<td>• By, For and About Youth – Annual peer conference where youth leaders from 10 community organizations teach approximately 300 youth about community issues and youth opportunities.</td>
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<tr>
<td>• New Concept Center – Monthly Family/Youth Education/Recreation program bringing youth and families together to learn and have fun.</td>
</tr>
<tr>
<td>• Peer Education/Counseling Program – Alcohol, drug and violence prevention and gang diversion program graduating 50 youth each year.</td>
</tr>
<tr>
<td>• Prevention Partnership – Culturally diverse parent educators trained provide peer support to Latino, Hmong, and African-American parents.</td>
</tr>
<tr>
<td>• Public Awareness Media Partnerships – Numerous media campaigns including Kids Don’t Drink/Don’t Smoke, Hang Tough Against Drugs Milwaukee Video Contest.</td>
</tr>
<tr>
<td>• Public Policy and Systems Change – Initiated by the Milwaukee Coalition Against Drug and Alcohol Abuse Task Force, the Black Health Coalition, and the Wisconsin ASSIST Project, projects include ongoing youth underage drinking campaign.</td>
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<tr>
<td>• Women’s Resource Initiative – Working with organizations that focus on individual policy and environmental issues related to women’s health.</td>
</tr>
<tr>
<td>• Neighborhood Organizing – Partnership with the City Weed and Seed and U.S. Attorney’s Office in Wisconsin to assist with supporting youth Safe Haven partners.</td>
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<tr>
<td>• Alcohol and Drug Self-Help Guide – With the Center for Addiction and Behavioral Health Research, this guide will provide Milwaukee’s inner city residents a culturally-sensitive alcohol problem self-help guide to be distributed to individuals through Inner city and Latino health organizations. Information guides such as these are designed as secondary prevention of alcohol problems by identifying “at-risk” drinkers/drug users and provides guidelines and options for change, and identifies community-based resources for early intervention.</td>
</tr>
<tr>
<td>• Community-Wide Substance Abuse Prevention Plan – A consortium of community leaders, researchers and prevention practitioners to strategize on community-based host, agent/vehicle and environmental prevention approaches to prevent substance abuse (including alcohol) in youth.</td>
</tr>
</tbody>
</table>

Source: Fighting Back, Inc. (Undated). Fighting Back Youth and Family Alcohol and Other Drug Prevention Programs.
Specific Recommendations

Based on data presented in this report, the Milwaukee Academy of Medicine recommends the following strategies for reducing alcohol-related illness, injuries and death in Milwaukee County. Consistent with the public health model, primary and secondary prevention efforts should be targeted toward the host, the agent/vehicle, and the environment.

### Recommended Host-Focused Prevention Strategies

- Prevention planning should be targeted primarily at youth and their families with direct input from youth in the development of age-appropriate program content and approaches.

- Primary and secondary prevention services should be directed at Women’s special health concerns and needs including perinatal care and health education, domestic violence counseling/crisis intervention and screening and identifying alcohol use by women and their significant other.

- Because of the relatively high proportionate concentration of ethnic minorities in Milwaukee County, particularly African American and Hispanic American populations, efforts should be directed proportionately to these groups. Primary prevention strategies should focus on creating positive, low-or-no-cost alternatives to alcohol and other drug involvement for minority or inner-city youth and secondary strategies should be directed at screening and identifying alcohol-related problems for minority and inner-city youth and adults.

- Based on evidence for the use of secondary prevention screening and brief intervention in primary care, medical settings, the Academy recommends research examining the effectiveness of screening and brief intervention in other health, education and social settings including, emergency rooms, perinatal clinics, community clinics, high school and college/university counseling centers, employee assistance programs, faith/religious institutions and informal recreation settings.

### Recommended Agent/Vehicle-Focused Prevention Strategies

- Alcohol content should be clearly labeled on containers and studies should be conducted on the effects of stopping the promotion of lower-cost, high-ethanol content beers and wines to certain populations.

- The Academy supports State of Wisconsin Assembly Bill 115 which penalizes the selling and distribution of larger alcohol container size beverages, such as the 40 ounce malt liquor beer, and recommends that the effects of implementing this bill be rigorously studied in Milwaukee’s Inner City.

- Alternative alcohol packaging materials, such as glass beer bottles that shatter into small fine-grained pieces to reduce the harm of being cut by broken glass should be promoted by harm reduction and injury prevention groups.
Barriers/Gaps in Knowledge

A number of barriers exist in both understanding the nature and breadth of alcohol-related problems and recommending specific primary and secondary prevention strategies that are effective. Some barriers include: (1) The lack of common local, state and national databases; (2) The lack of unequivocal data supporting primary and secondary prevention strategies; (3) The lack of integrated prevention and intervention services; and (4) The strong influence of special interest groups which lobby against and block legislative and community-based prevention program initiatives. The Milwaukee Academy of Medicine recommends, generally, that these barriers and knowledge gaps be addressed in any comprehensive community-based prevention program developed for Milwaukee County.

Recommended Environment-Focused Prevention Strategies

- Based on overwhelming empirical evidence, the Academy recommends that the State of Wisconsin reduces the allowable vehicular operating BAC level from .100 to 0.08.

- Consistent with 37 States and the District of Columbia, the Academy recommends that the State of Wisconsin pass Zero Tolerance legislation for underage drivers. The zero tolerance BAC level should be set at .02 (to provide some margin for false positive readings) for drivers under the age of 21; at present Wisconsin has zero tolerance for drivers 19 and under.

- As an alternative to increased State and Local excise taxes on alcoholic beverages, the Academy recommends supporting a “Dime a Drink” or “Nickle a Drink” legislation which would earmark funds collected to support specific prevention and intervention programs. A further plan would have municipalities collect and administer these funds locally.

- The direct effects of changing the state-wide liquor license fee from $500 to $10,000 on the number of liquor outlets in Milwaukee County should be examined. In addition, the indirect effects of this licensure fee on chronic and excessive alcohol consumption prevalence should be determined.

- Consistent with both the cities of Baltimore and Chicago, all billboard alcohol advertising should be banned in Milwaukee County residential neighborhoods.

- Local television stations should restrict alcohol commercial advertising during prime time hours and ban cartoon characters in alcohol ads that appeal to children.

- The Academy recommends supporting efforts to standardize the collection of epidemiological data on the incidence, prevalence and effects of moderate and excessive alcohol consumption in Milwaukee County. For comparison purposes, data collection should be consistent with national and State of Wisconsin procedures.
References


74. Fighting Back Initiative, Inc. (Undated). *Fighting Back Youth and Family Alcohol and Other Drug Prevention Programs*. 