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ALCOHOL-RELATED MORTALITY NEW JERSEY, 1996-1998

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Abstract
This report examines the impact alcohol consumption has on mortality in New Jersey. 1996-1998 New Jersey resident death certificate files and an algorithm which provides alcohol-attributable fractions were used to estimate deaths related to drinking alcohol. Alcohol is estimated to be the fifth leading cause of death in New Jersey and has a disproportionate effect on men, primarily due to injuries.

Introduction

More than half of American adults drink alcohol at least occasionally. While most drink moderately (1 or 2 drinks per occasion), about one-third have three or more drinks on average on days when they drink and about one-quarter report binge drinking (consuming 5 or more drinks on one occasion). Additionally, nearly 4 percent report driving after having too much to drink at least once in the month prior to survey.[1] New Jerseyans are below the national median for all indicators of alcohol consumption measured by the Behavioral Risk Factor Surveillance System but follow the national pattern of males drinking more than females at all levels of alcohol consumption.[1] While moderate consumption of alcohol may not be harmful and according to some studies may even be helpful[2-4], prolonged abuse of alcohol can lead to a host of chronic disease conditions, such as cirrhosis, cancer, and cerebrovascular disease, and excessive abuse of alcohol can cause a variety of injuries.

The World Health Organization defines alcoholism or alcohol dependence syndrome as “a state, psychic and usually also physical, resulting from taking alcohol, characterized by behavioral and other responses that always include a compulsion to take alcohol on a continuous or periodic basis in order to experience its psychic effects, and sometimes to avoid the discomfort of its absence; tolerance may or may not be present.”[5] From 1996-1998, an average of 117 New Jerseyans died as a direct result of alcoholism. However, an estimated additional 2,590 died of other alcohol-related diagnoses: 1,740 died as a result of the effects of prolonged use of alcohol and 850 died because of injuries caused by their use or another’s use of alcohol.

Data and Methods

To aid in estimating the disease impact of alcohol, the U.S. Centers for Disease Control and Prevention (CDC) developed an algorithm which estimates alcohol-related mortality (ARM). The algorithm, known as ARDI, supplies alcohol-attributable fractions (AAFs) which are applied

to mortality data by age, sex, and cause of death. The result is an estimate of the number of deaths in each age-sex-cause group which may be attributed to alcohol. For this report, the algorithm has been applied to New Jersey resident deaths from 1996 to 1998. The average annual New Jersey population for 1996-1998 was used to calculate rates and the 1940 U.S. standard million was used to compute age-adjusted rates.

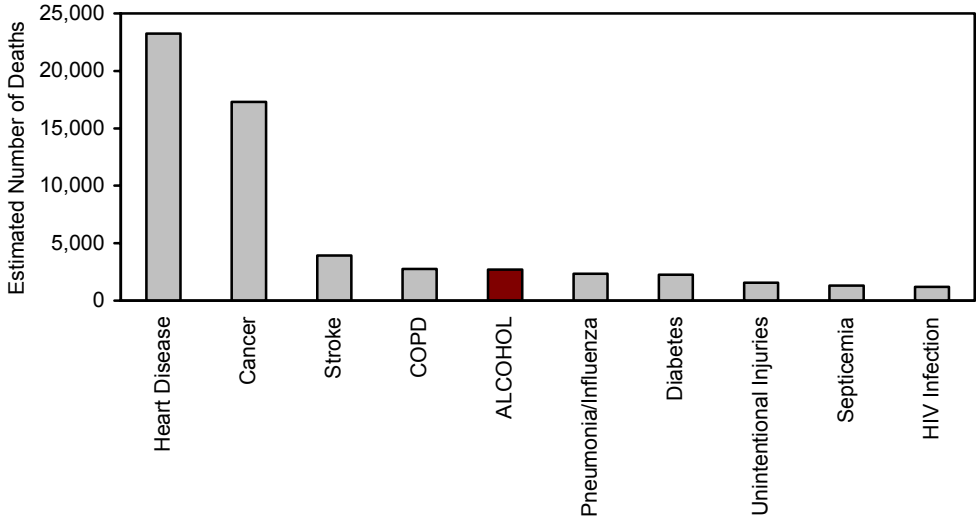
The ARDI algorithm produces an estimate of the number of deaths attributable to alcohol. The public health community views ARDI as a useful if somewhat crude tool for quantifying the impact of alcohol. However, a few caveats are in order. This estimate is based on certain assumptions about initiation and cessation behavior and the average duration of drinking by current and former drinkers. The model needs to be periodically updated to reflect changes in drinking behavior and treatment-related changes in survival from alcohol-related causes of death. The model also assumes that drinkers are no more likely than non-drinkers to die of non-alcohol related causes. There is another CDC-developed algorithm (SAMMEC) which produces estimates of smoking-attributable mortality. Between 1996 and 1998, an estimated 12,564 New Jerseyans died annually as a result of smoking.[6] While there is some evidence that the joint use of alcohol and tobacco increases the relative risk for developing certain cancers considerably[7], these potential interactions are not explicitly included in these estimates.

Results

It is estimated that 2,707 New Jersey residents died annually during 1996-1998 because of alcohol. The crude mortality rate was 895.4 for all causes of death and the alcohol-attributable rate was 33.6 per 100,000 population. The overall age-adjusted mortality rate for 1996-1998 was 461.0 while the alcohol-attributable age-adjusted mortality rate was 23.7 per 100,000 standard population.

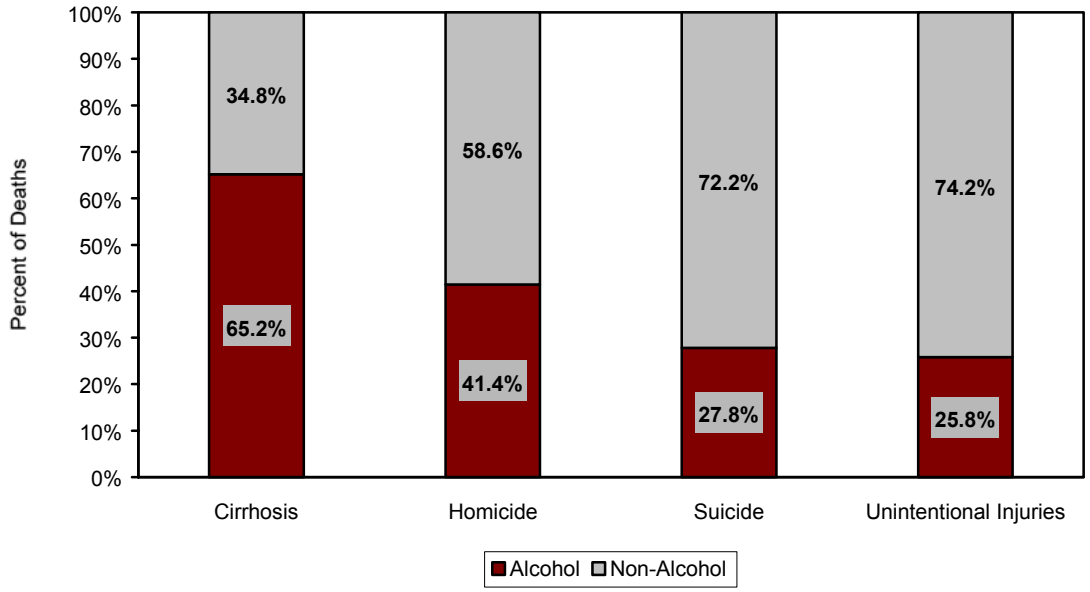
If alcohol were considered as a cause of death and deaths due to alcohol were removed from the standard cause groups used for ranking, alcohol would have been the fifth leading cause of death in New Jersey in 1996-1998 after heart disease, cancer, stroke, and chronic obstructive pulmonary disease (COPD) (Figure 1).

Figure 1. Comparative Causes of Death
New Jersey, 1996-1998 Annual Average



While many think adverse health effects of alcohol are limited to cirrhosis of the liver and auto accidents, alcohol abuse negatively impacts health in a variety of ways. Alcohol-related causes of death may be grouped into three broad categories: causes of death with explicit mention of alcohol, other alcohol-related diseases, and other alcohol-related injuries or adverse effects. Explicit-mention causes are those that are solely attributable to alcohol consumption, such as alcoholic cirrhosis of the liver and alcohol dependence syndrome. Other alcohol-related diseases and injuries are those for which a portion of deaths are related to alcohol but could be due to other factors, such as motor vehicle accidents, stroke, cancer of the esophagus, and cirrhosis without mention of alcohol. The AAFs for these causes range from 0.05 for diabetes and for pneumonia/influenza to 0.75 for esophageal cancer. This means that 75 percent of esophageal cancer deaths are attributable to alcohol consumption. Overall, alcohol is related to 65 percent of cirrhosis deaths, 41 percent of homicides, 28 percent of suicides, and 26 percent of unintentional injury deaths (Figure 2).

Figure 2. Percent of Deaths Related to Alcohol
New Jersey, 1996-1998



Over the three-year period, an average of 1,724 men and 983 women died annually in New Jersey due to alcohol. In addition to problems related to the analysis of small numbers, the algorithm does not provide estimates by race or ethnicity and because we cannot assume that drinking prevalence and its effects on health are the same for persons of different races and ethnicities, we cannot calculate ARM by race or ethnicity.

The ranking of the three broad alcohol-related cause of death groups (explicit mention, other diseases, and other injuries) were the same for both males and females. However, a higher proportion of alcohol-related deaths among females were from alcohol-related diseases, while males had a higher proportion of alcohol-related injury deaths and explicit alcohol deaths (Table 1) This is due primarily to the higher rate of injury deaths among males regardless of alcohol use.

TABLE 1. ALCOHOL-RELATED MORTALITY (ARM) BY SEX AND CAUSE GROUP
NEW JERSEY, 1996-1998 ANNUAL AVERAGE

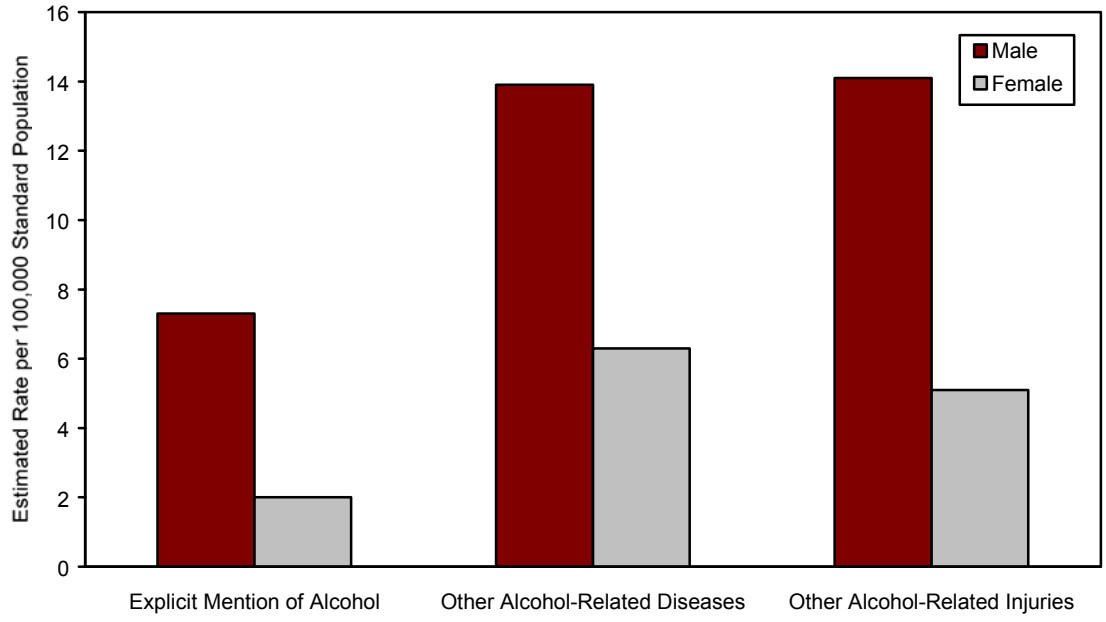
ALCOHOL-RELATED CAUSES OF DEATH (ICD-9 CODES)	MALE	FEMALE	TOTAL
Causes of Death With Explicit Mention of Alcohol	**336**	**104**	**440**
Alcoholic psychoses (291)	7	1	8
Alcohol dependence syndrome (303)	89	28	117
Alcoholic cardiomyopathy (425.5)	31	2	33
Alcoholic fatty liver (571.0)	7	4	11
Acute alcoholic hepatitis (571.1)	13	9	22
Alcoholic cirrhosis of liver (571.2)	131	39	171
Alcoholic liver damage, unspecified (571.3)	47	18	65
Accidental alcohol poisoning, NEC (E860.0, E860.1)	9	2	11
Other causes with explicit mention of alcohol (305.0, 357.5, 535.3, 790.3)	2	0	2
Other Alcohol-Related Diseases	**810**	**618**	**1,428**
Cancer of lip, oral cavity, pharynx (140-149)	78	34	111
Cancer of esophagus (150)	202	75	277
Cancer of stomach (151)	61	44	105
Cancer of liver and intrahepatic bile ducts (155)	33	21	54
Cancer of larynx (161)	52	11	62
Diabetes mellitus (250)	54	64	118
Essential hypertension (401)	5	9	15
Cerebrovascular disease (430-438)	116	176	292
Pneumonia and influenza (480-487)	53	67	120
Diseases of esophagus, stomach, and duodenum (530-537)	9	11	20
Cirrhosis of liver without mention of alcohol (571.5)	128	87	215
Acute pancreatitis (577.0)	14	14	28
Other diseases (011-012, 571.6, 577.1)	5	5	11
Other Alcohol-Related Injuries and Adverse Effects	**578**	**261**	**839**
Motor vehicle traffic and nontraffic accidents (E810-E825)	221	120	341
Accidental falls (E880-E888)	53	40	93
Accidents caused by fire and flames (E890-E899)	21	15	37
Accidental drowning and submersion (E910)	19	5	24
Suicide (E950-E959)	126	35	161
Homicide (E960-E969)	113	36	149
Other injuries and adverse effects (E826-E845, E901, E911, E917- E920, E922, E980)	24	10	34
Total	**1,724**	**983**	**2,707**

Source: New Jersey Department of Health and Senior Service, Center for Health Statistics

In absolute terms, for nearly all alcohol-related causes of death, more males died than females with the exception of essential hypertension (0.6 male deaths to 1 female death); stroke (0.7:1); pneumonia and influenza; diseases of esophagus, stomach, and duodenum; and diabetes (each 0.8:1). The ratio of male deaths to female deaths was highest for alcoholic cardiomyopathy (15.5 male deaths to 1 female death), followed by alcoholic psychoses (7:1), larynx cancer (4.7:1), accidental alcohol poisoning (4.5:1), accidental drowning (3.8:1), suicide (3.6:1), alcoholic cirrhosis of liver (3.4:1), alcohol dependence syndrome (3.2:1), and homicide (3.1:1) (Table 1). Alcoholic psychoses are "organic states due mainly to excessive consumption of alcohol."[5]

Age-adjusted ARM rates were higher for males than for females for all three broad cause of death groups. The total age-adjusted ARM was 35.3 for males and 13.4 for females per 100,000 standard population. Male and female age-adjusted ARM rates for the broad cause groups were as follows: 7.3 and 2.0 for causes with explicit mention of alcohol, 13.9 and 6.3 for other alcohol-related diseases, and 14.1 and 5.1 for other alcohol-related injuries and adverse effects, respectively (Figure 3). This is due to higher male drinking prevalence.

Figure 3. Age-Adjusted ARM Rates by Sex and Cause Group
New Jersey, 1996-1998 Annual Average



Years of potential life lost (YPLL) is a measure of the number of years of life not lived by each individual who dies before reaching a predetermined age, usually 65. The YPLL for a population is computed as the sum of all the individual YPLL for persons who died during a specific time period. The average annual YPLL for all causes of death in New Jersey for 1996-1998 was 314,364 years. Of that, 28,025 YPLL (8.9%) was due to alcohol. By sex, 10.6 percent of male YPLL and 6.1 percent of female YPLL was due to alcohol.

Injuries were the leading cause of alcohol-related YPLL in New Jersey in 1996-1998, causing 18,621 years of potential life to be lost (13,916 male and 4,705 female). This is due to the young age at death (15-44 years) for most alcohol-related injuries. Alcohol-related diseases

caused a loss of 9,404 years of potential life (6,946 male and 2,458 female). Since it may take many years for alcohol to fatally damage a person's organs and tissues, most deaths due to alcohol-related diseases occur among older persons (those aged 45 and over).

Another way to consider the impact of alcohol on mortality would be to imagine what would happen if no one drank alcohol. To do this, we must recompute mortality rates without the alcohol-related deaths. If no one in New Jersey died from alcohol-related causes, the average annual number of deaths in 1996-1998 would have been 69,390, the crude death rate would have been 861.8, and the age-adjusted death rate would have been 437.3. Deaths due to cirrhosis would decrease by over 65 percent, homicides would decline over 40 percent, and suicide and unintentional injury deaths would each decrease over 25 percent. Currently, these causes of death rank among the top twenty among all New Jerseyans. Unintentional injuries are the number one killer of those under age 45 and suicide, homicide, and cirrhosis rank sixth, seventh, and tenth, respectively. Without alcohol, homicide would drop to eighth and cirrhosis to twentieth among leading causes of death for residents under age 45.

Discussion

Three-fifths of New Jersey residents drink alcohol at least once a month. Three percent of residents are heavy drinkers and 15 percent are binge drinkers. In addition to the impact alcohol has on mortality, drinking has a considerable impact on morbidity and direct and indirect economic costs to society.[8] This analysis has shown that decreases in prevalence could have a sizable impact on deaths and years of potential life lost. While the mortality rate related to alcohol among Americans has decreased over the years, continued progress must be made to reduce the health impact of alcohol consumption.[9] This includes efforts to promote drinking cessation, prevent initiation of alcohol use, and protect nondrinkers from the hazards when an intoxicated person gets behind the wheel of an automobile.[10] Steps currently being taken in New Jersey include a new rule proposed by the Department of Transportation for the installation and use of breath alcohol ignition interlock devices to satisfy sentencing requirements for those convicted of driving under the influence (DUI),[11] a provision to existing DUI laws and penalties which mandates a disorderly persons offense if a parent or guardian is convicted of DUI while driving with a minor under age 17 as a passenger in the motor vehicle,[12] grants to county and state colleges for educational outreach and training courses on alcohol management and underage drinking,[13] core curriculum standards for elementary school students requiring instruction on the effects of the use and abuse of alcohol and other drugs,[14] and grants from the Department of Health and Senior Services to support treatment services[15].

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