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Commentary on Callaghan *et al.* (2013): Minimum legal drinking age laws protect high school students from both crashes and alcohol abuse

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The US National Highway Traffic Safety Administration (NHTSA) has just announced that in 2010, 552 lives were saved by the minimum legal drinking age (MLDA) laws in force in all 50 states. The total savings reported by NHTSA dating back to 1975 is 28 315 lives [1]. Despite this major benefit, the MLDA has been under attack based principally on policy considerations [2]. Responding to this attack has been difficult because the strongest evidence for their effectiveness dates back to the 1980s, when states were enacting MLDA laws. During that time panel studies employing time-series analysis could pair states with and without MLDA laws. The results of those studies was overwhelmingly positive [3], perhaps the strongest evidence for any traffic safety policy. However, similar research has not been possible, as all 50 states enacted MLDA laws in 1988. Recently, a new methodology, regression discontinuity analysis for testing the effectiveness of the MLDA, has been applied both in the United States [4] and in Canada [5] that has shown new and important evidence for the effectiveness of the MLDA laws based on the increase in problem behavior which occurs when youths reach the minimum legal drinking age limit and are no longer subject to its restrictions.

Of particular interest is the Callaghan, Sanches & Gatley [5] study of the effect of Canada's MLDA law. It is significant because of its focus on health benefits beyond traffic safety and because the Canadian provinces' MLDAs are set at either age 18 or 19 years, the probable level in the United States should the current federal law supporting the age 21 limit be repealed. The authors have taken advantage of the broad coverage of Canada's national health system that provides access to impaired inpatient hospital care independent of income and varying insurance policies, which the authors note 'provides near census estimates' of all the problems they targeted. Besides a significant increase in traffic injuries, they found significant increases in suicides, alcohol poisonings and alcohol use disorders and, for men,

injuries from varying sources such as falls, as young adults in Canada moved out from under the limitations of the MLDA law at age 18 or 19 years. This suggests that if the US MLDA laws were lowered to the 18–19-year age range, it would lose its protective value for 19- and 20-year-olds, but it would still provide significant protection to those who are younger.

However, a critical factor not tested in the Callahan *et al.* study is the trickle-down effect of empowering 18-year-olds to purchase alcohol on the availability of alcohol to the 15–17-year-old high school age group.

Currently in the United States, no high school student can purchase alcohol, but if the MLDA is lowered to age 18 high school seniors will have access to alcohol. The study in New Zealand by Kypri *et al.* [6] found that the effect of reducing the MLDA from 19 to 17 was principally evident in the increase in hospitalizations of 14- and 15-year-olds. Research on the potential trickle-down impact of a reduction of the MLDA to age 18 is particularly needed in view of the extensive evidence of the significance of early onset of drinking to adult impaired driving [7,8] and alcohol abuse problems [7–9].

The effectiveness of the MLDA, given the relatively low level of enforcement [10], has been impressive, and although enforcement of underage sales laws can be effective, it is expensive, as repeated enforcement crack-downs are required [11]. Thus, it is unlikely that further benefits will be achieved through police action. The greatest opportunity for strengthening MLDA laws and particularly early onset of drinking appears to lie in motivating parents to increase their engagement with their teenagers drinking. Currently, 99% of American drivers aged 16–20 and 97% of all adults view impaired driving as a significant threat to their safety [12]; consequently, additional education on that point might have little power to produce further progress. Less well understood are the risks of alcohol poisoning and alcohol use disorders related to early use of alcohol [7–9]. The Callaghan study (and the similar regression discontinuity study by Carpenter & Dobkin [4]) might be helpful in programs designed to encourage parents to be involved in the underage drinking problem, as they call attention to the impact of MLDA laws on non-highway issues.

An interesting challenge for MLDA laws in the United States is the growing concern over drugged driving [13]. Those states that are enacting *per se* illegal laws for drugs generally specify that, as with alcohol, the legal level for drugged driving should be zero for those aged younger than 21 [14]. Policymakers need to consider the potential impact of reducing the minimum drinking age from 21 to 18 on the viability of the zero-tolerance law for alcohol and the implications for drugged-driving laws for drivers younger than age 21. Findings such as those of Callaghan *et al.* suggest that not maintaining zero limits for drug involvement will have serious effects on injury outside the driving area.

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