The magic number: The case for a 21-year-old minimum drinking age in Australia

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The United States is unique among Western countries in setting the minimum legal drinking age at 21 years. The choice of 21 was largely driven by a powerful road-safety lobby group in the 1980s; however a wealth of clinical and epidemiological evidence has subsequently emerged in its favour. A highly-publicised article in the *Medical Journal of Australia* [1] recently proposed raising the Australian minimum drinking age from 18 to 21, citing both sociological and neurodevelopment arguments. This essay reviews the three conditions that should be satisfied for such a legislative change to occur, and proposes an alternate license-based model for age regulation as a thought experiment.

Age-21 laws in the 21st Century

When prohibition ended in the United States in 1933 with the 21st Amendment, states were given autonomy to set their own alcohol regulations. This included the minimum legal drinking age. The commonest age chosen was 21 years (in 32 states), followed by 18 years (13 states), 20 years (3 states), and 16 years (in Ohio). [2] 21 was likely favoured because, at the time, this was the age of majority in most US states – the age when an individual was legally considered an adult, the age when they could vote in state elections. [3]

Forty years later, in the midst of the Vietnam War, the issue of drinking age emerged once again into the spotlight. A public campaign argued that it was nonsensical for a man to be conscripted to the army, be sent abroad to fight and die for his country, and yet not legally be permitted to have a drink. One by one, under strong public pressure, the states lowered the drinking age to 18 years. [3] This coincided with changes in the age of majority at a federal level. The 26th Amendment of 1971 gave 18-20 year-olds the right to vote in the United States – 18 years became the age of adulthood.

However, while voting rights persisted for 18-year-olds, this lowered drinking age lasted but one generation. In 1984, the Reagan administration passed the *National Minimum Drinking Age Act*, which raised the legal drinking age to 21 again. [4] To expedite the change, the federal government threatened significant infrastructure cuts to any states that did not comply. By 1988, alcohol was banned for under-21s in all 50 states and territories across America. Even Ohio.

The strongest lobby group in support of this raised drinking age was "Mothers Against Drunk Driving" (MADD) – a not-for-profit organisation run by mothers of the victims of alcohol-fuelled driving accidents, many of whom were under the age of 21. [5] MADD claims that this legislation has saved over 25,000 lives since 1988, purely from traffic-related morbidity. [6] Subsequent evidence has confirmed that a 21-year old drinking age has benefits far beyond road safety, reducing the incidence of alcohol dependence [7], alcohol-related violence [8], suicide [9], and risky sexual behaviours amongst youth. [10] More recent neurodevelopmental evidence has bolstered the case, demonstrating that alcohol exposure impairs neuronal maturation in under-21s. [11] Consequently, the US persists in this awkward legislative balance where individuals can vote, drive and enlist in the army at 18, but cannot yet purchase a beer.

This is not unique from an international perspective in that 6 other nations have a 21-year minimum drinking age: Sri Lanka, Indonesia, Kazakhstan, Oman, Pakistan and Palau. [12] In all these cases, the

choice of 21 was driven far more by cultural and religious factors than epidemiological evidence. The closest other OECD nation is Japan, with a drinking age of 20. The vast majority of countries have chosen 18 years, in line with the standard age of legal majority. Switzerland, Belgium, Austria, Germany, and the Netherlands have all chosen an age of 16.

Advance Australia where?

Although it is clearly not the mainstream position internationally, public support is growing for a 21 year minimum drinking age in Australia. In 2010, 50.2% of respondents supported such a change, compared to 40.7% in 2004. [13] In a 2014 article in the *Medical Journal of Australia*, Toumbourou et al. elegantly assembled the case for a 21-year threshold [1]. The article gained significant media attention in May 2014, catapulting the issue of drinking age into the spotlight – not for reasons of youth enfranchisement (as in the Vietnam era), not for reasons of road safety, but with a comprehensive clinical and epidemiological argument behind it. The National Alliance for Action on Alcohol and the Australian Medical Association have added weight to this "age-21" campaign. But is this a realistic option for Australia? In the delicate balancing act between theoretical goals and practical realities, what age is the magic number? Is a single age too simple?

The burden of proof

Any case for age-21 legislation in Australia should demonstrate three key points:

(i) That alcohol consumption at 18-21 years causes significant negative outcomes
(ii) That age-21 regulations are effective at reducing the alcohol intake of under-21s
(iii) That the benefit of alcohol restriction outweighs the value of preserving 18-21 year olds' autonomy

The reason point (iii) is necessary is that points (i) and (ii) are likely true for all age groups: restricting alcohol purchase would presumably reduce alcohol consumption and therefore alcohol-related complications irrespective of age. As a society, we have made a policy decision to tolerate alcohol use despite its associated risks in the interests of public autonomy. So the real question here is whether under-21s are disproportionately affected by alcohol-related risks to the point that this autonomy should be overridden and all consumption legally forbidden. Is the 18-21 age group really so vulnerable?

Condition 1: An age of vulnerability

There is accumulating evidence to suggest that 18-21 year olds are a population at extreme risk from alcohol-related complications based on neurodevelopmental, road-safety, and behavioural data.

1. Neurodevelopmental

Cross-sectional studies have shown that alcohol consumption during adolescence is associated with short- and long-term cognitive impairment, including deficits in information processing, memory, attention and executive function. [11,14] This is especially true for binge drinking behaviours. [15] Structurally, there appears to be impaired white matter development in the prefrontal cortex and fronto-striatal circuitry, which has been demonstrated with CT [16], fMRI [17] and post-mortem data. [18] However, some critics have argued that these neurobiological variations may be pre-existing features that predispose individuals to alcohol experimentation, rather than the consequence of alcohol abuse. For example, in a recent review article Clark et al. [19] suggest that studies have not sufficiently controlled for confounding psychological variables, such as attention deficits and disruptive behaviours, which are known to be associated with early alcohol experimentation. To clarify the causal links, further longitudinal data is required assessing the baseline neurobiological status of adolescents before their first alcohol exposure.

2. Road safety

A 2001 meta-analysis of 9 population studies found that raising the minimum legal drinking age from 18 to 21 caused a 12% reduction in overall road-related mortality. [20] This aligns with the data collected by MADD and the National Highway Safety Administration in the United States [6]. However, the question arises whether these improvements in road safety are age-specific. Would raising the drinking age to 25 also cause a 10% drop in accidents among 21-24 year-olds? The argument is that 18-21 year-old drivers are the least experienced, the least responsible, and therefore the most vulnerable to alcohol. However, there is a lack of rigorous data to demonstrate age-specificity. The legal alcohol limits for driving in Australia are somewhat age-dependent, with L- and P- drivers having a zero blood-alcohol tolerance, compared to 0.05% for full-licensees. Does a differential blood alcohol threshold provide adequate protection to account for the clear difference in risk profile between adolescents and older drivers? [21]

3. Risk behaviours

Beyond road-related accidents, there is strong evidence to suggest a broader correlation between alcohol use and risky behaviours. A survey of Australian 17-19 year olds on "Schoolies" showed that 64% had consumed more than 10 drinks on a single occasion, and 18% displayed risky sexual behaviours. [22] A survey of almost 9000 American adolescents 12-21 showed a striking correlation between alcohol excess and physical violence [23]; while Miller et al. argue that early alcohol consumption, especially in the form of binge drinking, may be a precursor of other illicit drug use. [24] Many studies also demonstrate a link between alcohol excess and suicidal behaviours in adolescents, however the causal direction has not been well characterised. [25] These are compelling arguments that demonstrate not only a deleterious effect of alcohol, but also a clear correlation between minimum age legislation and outcome data.

Condition 2: The power of the law

Despite certain experimental shortfalls, the overarching trend across neurodevelopmental, road safety and behavioural data seems to support this notion of 18-21 year-olds being particularly vulnerable to alcohol. If we accept this to be true, then the second key burden of proof relates to whether an elevated age gap actually does translate into a reduction in early-age alcohol consumption. Some critics argue that higher age restrictions in fact drive alcohol use underground and lead to more dangerous patterns of consumption. [26] In other words, age-21 laws do not allow adolescents to learn safe drinking practices within a family context, instead forcing them to experiment independently, albeit at a later age. However, the data from large-scale European studies comparing adolescent drinking behaviours in the EU and US strongly suggest otherwise. The European School Survey Project on Alcohol and Other Drugs (ESPAD) found that a greater proportion of 10th-graders in Europe had consumed alcohol within the past 30 days (33% in the US versus 80% in Denmark, 75% in Germany, 64% in France). [26] Furthermore, a higher percentage had been intoxicated before age 13 (8% in the US versus 25% in Denmark, 14% in Germany, 9% in France). Of course, it is difficult to disentangle the effect of legislation in each of these countries from the influence of culture and tradition. However, on the surface it would appear that countries with lower drinking age consistently show earlier exposure to alcohol in adolescence.

New Zealand data have demonstrated that youth several years below the legal drinking age invariably gain access to alcoholic products through older friend circles and siblings [27] – a phenomenon that Tambourou et al. refer to as the "trickle-down" effect. [1] Evidence suggests that an upward shift in the legal drinking age not only reduces the number of 18-21 year olds consuming alcohol, but also significantly reduces the likelihood of 15-18 year olds acquiring it. In summary, the evidence supports the hypothesis that legal restrictions do translate into community practice.

Condition 3: A balancing act

Having satisfied the first two conditions, we arrive at the third and most challenging question: does the negative impact of alcohol amongst under-21s outweigh their personal autonomy as legal adults? Tangled up with this argument is the deeply-ingrained cultural idea that alcohol consumption is a mark of adulthood, a rite of passage. By instituting age-21 laws, the state would not only be removing personal autonomy, but also stamping out cultural aspects of the coming-of-age tradition. Is this fair, is it necessary, is it overly paternalistic? There is some evidence to suggest that raising the minimum legal drinking age causes a 'reactance phenomenon' where underage individuals drink more in response to the imposed restrictions. [28] However a large meta-analysis by Wagenaar et al. disputes this finding, demonstrating amongst 33 studies from 1960-2000 a strong inverse relationship between minimum drinking age and alcohol consumption rates. [29]

In spite of these data, there remains the fundamental philosophical issue of whether it is equitable to impose a blanket regulation across all under-21s when the negative statistics are driven by a small minority of excessive alcohol drinkers? Ultimately, these are questions of political philosophy more than clinical data – to what extent should the state protect individuals from themselves? There are no easy answers. This is a situation where public opinion must shape government policy.

An individualised system

One key problem is that public policy cannot take into account the diversity of the target population – with 18-21 year olds varying significantly in maturity, family support, and risk-taking behaviour. Given this variability, one might consider a system where alcohol regulations are personally tailored. As a thought experiment, consider the possibility of "alcohol licenses" for individuals. An 18-year-old might be required to pass a written examination on content similar to the current *Responsible Service of Alcohol* syllabus. There could be a point system, with points lost and licenses potentially revoked for alcohol-related misdemeanours. Perhaps even a provisional license system (like L- and P-plates) restricting the type and quantity of alcohol that could be purchased by youth. This would require a large bureaucratic infrastructure to support it; however it may be one option for creating a smoother pathway from adolescence into responsible alcohol use.

Conclusions

Toumbourou et al. conclude their article with a call-to-action for a multi-level advocacy campaign in support of age-21 regulations. [1] However, perhaps the real value is in the dialogue more than the outcome. Ultimately, drinking age is an arbitrary number that does

not perfectly match the maturity levels of all individuals and certainly does not perfectly translate into alcohol consumption patterns. The important point is that society becomes aware of the risk of premature alcohol use, and that this knowledge becomes integrated into family education, peer dynamics, and youth culture. The real goal should be for adolescents to approach alcohol in a mature and sensible fashion. Regardless of where the Australian law ultimately settles, perhaps it takes a high-profile legislative debate in order to bring this conversation into the spotlight.

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Conflict of interest

None declared.

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References

[1] Toumbourou J, Jones S, Hickie B. Should the legal age for alcohol purchase be raised to 21? Med J Aust, 2014;200(10):568-70.

[2] Miron J, Tetelbaum E. Does the minimum legal drinking age save lives? Economic Inquiry 2009;47(2):317-36.

[3] The law relating to age of majority, the age of marriage and some connected subjects, in Working Paper No. 2. 1977, The Law Reform Commission.

[4] LegalFlip. Why is the Legal Drinking Age 21 in the United States? 2014; Available from: http://www.legalflip.com/Article.aspx?id=20&pageid=84.

[5] DeJong W, Blanchette J. Case closed: research evidence on the positive public health impact of the age 21 minimum legal drinking age in the United States. J Stud Alcohol Drugs, 2014;Suppl 17:108-15.

[6] Lives saved in 2008 by restraint use and minimum drinking age laws - in National Highway Traffic Safety Administration. June 2009.

[7] Dawson DA, Goldstein RB, Chou SP, RuanW J, Grant BF. Age at first drink and the fi rst incidence of adult-onset DSM-IV alcohol use disorders. Alcoholism: Clin Exp Res 2008;322:149-60.

[8] Hingson R, Heeren T, Zakocs R. Age of drinking onset and involvement in physical fights after drinking. Pediatrics, 2001;108:872-77.

[9] Birckmayer J, Hemenway D. Minimum-age drinking laws and youth suicide, 1970-1990. Am J Public Health Res, 1999;89:1365-68.

[10] Hingson R, Heeren T, Winter MR, Wechsler H. Early age of first drunkenness as a factor in college students' unplanned and unprotected sex attributable to drinking. Pediatrics, 2003;111:34-41.

[11] Squeglia L, Jacobus J, Tapert SF. The Influence of Substance Use on Adolescent Brain Development. Clin EEG Neurosci, 2009;40(1):31-38.

[12] Hanson GR, Venturelli PJ, Fleckenstein AE. Current statistics and trends in alcohol consumption, in Drugs and Society. 2015, Jones & Bartlett Publishing.

[13] National Drug Strategy Household Survey report, in AIHW Cat. No. PHE 145. 2010, Australian Institute of Health and Welfare.

[14] Hermens D, Lagopoulos J, Tobias-Webb J. Pathways to alcohol-induced brain impairment in young people: a review. Cortex, 2013;49:3-17.

[15] Carlen PL, Fornazzari L, Bennett J, Wikinson DA. Computerized tomographic scan assessment of alcoholic brain damage and its potential reversibility. Alcohol Clin Exp Res 1986;10:226-32.

[16] Agartz I BS, Hamma FJ, Svinhufvud K. Volumetry during acute alcohol withdrawal and abstinence: a descriptive study. Alcohol, 2003;38:71-78.

[17] Krill J, Halliday GM, Svoboda MD, Cartwright H. The cerebral cortex is damaged in chronic alcoholics. Neuroscience, 1997;73:993-98.

[18] Clark DB, Thatcher DL, Tapert SF. Alcohol, psychological dysregulation, and adolescent brain development. Alcoholism: Clin Exp Res, 2008; 32(3):375-385.

[19] Shults R, Elder RW, Sleet DA. Reviews of evidence regarding interventions to reduce alcohol-impaired driving. Am J Prev Med, 2001;21(4)Suppl 1:66-88.

[20] Jonah BA, Dawson NE. Youth and risk: age differences in risky driving, risk perception, and risk utility. Alcohol Drugs and Driving, 1987;3(3):13-29.

[21] Jones S BL, Robinson L. The schoolies experience: the role of expectancies, gender roles and social norms of recent school leavers. Wollongong, NSW: Centre for Health Initiatives, University of Wollongong, 2011.

[22] Swahn MH. Alcohol-consumption behaviors and risk for physical fighting and injuries among adolescent drinkers. Addictive Behaviors, 2004;29(5):959-963.

[23] Miller JW. .Binge drinking and associated health risk behaviors among high school students Pediatrics, 2007;119(1):76-85.

[24] Hallfors DD. Adolescent depression and suicide risk. Am J Prev Med, 2007;27(3):224-231.

[25] Friese B, Grube JW. Youth drinking rates and problems: a comparison of European countries and the United States Prevention Research Center - Pacific Institute for Research and Evaluation.

[26] Kypri K, Dean J, Kirby S. 'Think before you buy under-18s drink': evaluation of a community alcohol intervention. Drug Alcohol Rev, 2004;24:13-20.

[27] Allen DN, Sprenkel DG, Vitale PA. Reactance theory and alcohol consumption laws: further confirmation among collegiate alcohol consumers. J Stud Alcohol, 1994; 55(1).55-67

[28] Wagenaar AC,Toomey TL. Effects of minimum drinking age laws: review and analyses of the literature from 1960 to 2000. J Stud Alcohol Suppl, 2002;(14):206-25.