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Health consequences of easier access to alcohol: New Zealand evidence

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ABSTRACT

We evaluate the health effects of a reduction in New Zealand's minimum legal purchase age for alcohol. Difference-in-differences (DD) estimates show a substantial increase in alcohol-related hospitalizations among those newly eligible to purchase liquor, around 24.6% (s.e. = 5.5%) for males and 22% (s.e. = 8.1%) for females. There is less evidence of an effect among ineligible younger cohorts. There is little evidence of alcohol either complementing or substituting for drugs. We do not find evidence that earlier access to alcohol is associated with learning from experience. We also present regression discontinuity estimates, but emphasize DD estimates since in a simulation of a rational addiction model DD estimates are closer than regression discontinuity estimates to the policy's true effect.

1. Introduction

Alcohol consumption is enjoyable for most adults, but it is also risky as excess consumption can lead to antisocial behavior and health problems. These risks are especially salient when it comes to young people who may be more physiologically sensitive or psychologically immature (Cook, 2007). Almost all countries legally prohibit the purchase or public consumption of alcohol for those below some threshold age. Most OECD countries have a drinking age of eighteen, though several western European countries maintain a drinking age of sixteen.[1] A lower threshold age has both benefits, since alcohol consumption is enjoyable, and costs.

Our paper estimates some of the health consequences of access to alcohol among young people. We use difference-in-differences (DD) and regression discontinuity (RD) methods to examine New Zealand data on hospitalizations over the period in which the minimum legal age for purchasing alcohol was reduced from twenty years to eighteen. We use those over twenty as our primary comparison group since the lower purchase age should not have had much impact on this group and any changes we see in it can proxy for broader social influences that affect eighteen and nineteen year olds too. We construct two RD estimates, one based on comparing eighteen and nineteen year olds just before and just after the law change, and the other based on comparing outcomes for those just below and just above the threshold age.

More specifically, we examine the following questions. First, what was the effect of reducing the minimum purchase age on hospitalizations of eighteen and nineteen year-olds? This is the group that became legally entitled to purchase liquor. Second, how were those under the age of eighteen affected? Since law enforcement is imperfect, it is important to consider the consequences for those ostensibly not affected by the law. Third, are negative health consequences for young people due to their youth or their inexperience? If it is inexperience, then the argument for a higher minimum purchase age is more limited. In principle, our setting permits us to distinguish between effects of age and experience, exploiting the variation in experience across cohorts induced by the lowering of the minimum purchase age. Fourth, did changes in the liquor laws affect drug-related health problems as suggested by the substitution hypothesis (DiNardo and Lemieux, 2001).

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[1] http://www.icap.org/PolicyIssues/YoungPeoplesDrinking/tabid/108/Default.aspx.

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We find a significant increase in hospitalizations as a consequence of passage of the Sale of Liquor Amendment Act (1999). Among eighteen and nineteen year old males difference-in-differences estimates indicate a 24.6% (s.e. = 5.5%) increase in alcohol-related hospitalizations. For females in the same age group, the estimated effect is 22% (s.e. = 8.1%). We find some evidence of an increase in hospitalizations for males younger than eighteen, but this appears to be driven mostly by changes in relative cohort size over time. Using RD to compare eighteen and nineteen year olds just before and just after the law change shows larger effects. Regression discontinuity evidence suggests that neither younger age groups nor older age groups are affected. We do not find evidence that the lower drinking age reduced the prevalence of drug-related problems. In fact we find some evidence of an increase in drug-related hospitalizations, though this evidence is somewhat fragile, as we discuss below.

Using two different measures of experience, we find evidence that experience with alcohol does not have benefits for those close to the age of legal eligibility. With one measure, after conditioning on age, each year above the minimum purchase age is associated with around 2.9% (s.e. = 2.3%) higher hospitalization rates, on average, for males according to our main specification. The point estimate is small compared with the effect of attaining legal eligibility. This result is broadly consistent with estimates using an alternative measure of experience, the cumulated prior alcohol-related hospitalizations for a cohort, though the estimates for males are statistically significant with that measure. For females we find no statistically significant evidence of an experience effect.

We simulate a basic rational addiction model (Becker and Murphy, 1988) to provide a framework for interpreting the different magnitudes obtained across the DD and RD models. We simulate time paths for different cohorts' age-consumption profiles and subject the model to a change in the minimum purchase age. In the model consumption changes only slightly when a youth becomes old enough to consume legally. By contrast, when the law changes there is a large increase in consumption for those newly eligible. A difference-in-difference estimate using the simulated data is in between the two regression discontinuity estimates and is close to the steady-state effect of the policy change. From the perspective of the rational addiction model, the DD estimates are more reliable guides to the true results of the policy.

For several reasons, our estimates could be thought of as a lower bound on the cost of the law change. We do not measure all long-term health consequences such as alcoholism, nor do we estimate externalities due to automobile accidents for example. More generally, there are benefits and non-health costs that we do not study, so our results are only a partial assessment of the merits of a lower drinking age.

This paper gives some historical background about alcohol consumption and legislation in New Zealand as well as a review of the literature on the effects of minimum purchase age laws in Section 2. Section 3 discusses our data and empirical approach. Section 4 presents our main results. Section 5 discusses the model as a framework for interpreting our empirical results.

2. Related literature

2.1. Historical background

Belich (1996) notes that New Zealanders in the 19th century were very young, very male, very transient, and very often drunk. Excessive drinking and associated public disorder and crime were seen as significant social problems of the day. In response, New Zealand's parliament passed around 50 laws between 1880 and 1920 restricting the consumption of alcohol (Belich, 2001). A temperance movement gained majority support for legal prohibition in referenda, but not the super-majority required to pass.

In 1910, the legal drinking age was raised from eighteen to twenty-one. A 1917 law prohibited liquor sales after six o'clock p.m.[2] In 1969, the minimum purchase age was lowered from twenty-one to twenty. Continuing this liberalization, many restrictions on liquor licensing were eased in 1989, and in 1999 the Sale of Liquor Amendment Act lowered the minimum purchase age from twenty to eighteen.[3] Our paper studies the health consequences of this lower minimum purchase age.

The Sale of Liquor Amendment Act introduced a variety of other changes to the existing law. Among these, supermarkets were permitted to sell beer, and off-licence proprietors became eligible to trade on Sundays, changes that expanded alcohol availability.[4] Since the law altered regulations governing supply and demand for liquor, one might be concerned that liquor prices changed as a result of the law. To the extent that eighteen and nineteen year olds have different price elasticities of demand from those in our comparison group, our estimates conflate the effect of a lower purchase age and changed liquor prices. However, data from Statistics New Zealand do not support this concern. The price series for beer, wine, and spirits do not show signs of a break around the passage of the law.

A dominant narrative around the passage of the Sale of Liquor Amendment Act was that access to alcohol would be less restricted but that any restrictions would be enforced more thoroughly. Hence, the new law changed the rules relating to liquor licences and bar management, providing for fines for promoting excessive consumption, and increasing fines for selling to minors or supplying people already intoxicated. The law also introduced an evidence-of-age regime that encourages sellers to request photographic identification for proof-of-age purposes, since the reasonable belief, based on identification, that a patron was of legal age could be used as a defense against the charge of supplying a minor.

An objection to our empirical strategy is that the effect of the minimum purchase age depends on the nature of the evidence-of-age regime, so the effect of a change in the MPA is larger when credible identification is generally required. We contend that our control group, in their early twenties, is likely to be affected by the change in the evidence-of-age regime but that the difference-in-differences approach will remove this component of the change in outcomes for the treated group. Furthermore, we note that the older the control group is, the less affected it is by requirements to show identification, so the estimated effect on the treated group should be smaller when we use older age groups for the control group. As we discuss in Section 4, the opposite is true.

Since 1999, debate has continued about the appropriate MPA. Harms associated with youth drinking, such as public intoxication, unwanted sexual encounters, and alcohol-induced violence, have promoted interest in returning the minimum purchase age

[2] This gave rise to the so-called 'six o'clock swill' in which men would rush from their workplace to the public bar and consume a large amount of liquor before driving home.

[3] Technically, the law restricts the purchase and public possession of liquor to those over the threshold age. It does not directly restrict consumption by those below the age. Therefore, we prefer the term minimum purchase age over drinking age. Rules in the United States similarly place restrictions primarily on the purchase and public possession of liquor.

[4] The following website from New Zealand's Ministry of Justice has a summary of the major changes of the SLAA 1999: http://www.justice.govt.nz/publications/publications-archived/1999/amendments-to-the-1989-sale-of-liquor-act/publication.