



**FACULTAD DE CIENCIAS EMPRESARIALES Y ECONOMIA**

**Serie de documentos de trabajo del Departamento de Economía /  
Department of Economics Working Papers Series**

**THE IMPACT OF PARENTAL DRINKING ON CHILDREN'S USE OF HEALTH CARE**

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Working paper UM\_CEE\_2011-01  
<http://www.um.edu.uy/cee/investigaciones/>

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# The Impact of Parental Drinking on Children's Use of Health Care

March 18, 2011

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## ABSTRACT

**Objective:** Alcohol misuse by parents can affect the demand for children's health care in a number of different ways. The primary objective of this study is to estimate the impact that high-intensity drinkers have on their children's use of pediatric visits and ER care.

**Method:** We use a nationally representative sample of parents and children from the 2002-2008 National Health Interview Surveys and employ propensity-score methods (PSM). PSM can address some of the limitations associated with multivariate regression models both by using a non-parametric approach that does not rely on functional form assumptions and by statistically selecting a subset of untreated individuals for whom the distribution of covariates is similar to the distribution in the treated group. Our working sample consists of 65,926 pairs of adults and children.

**Results:** We find that alcohol consumption by parents is positively associated with children's health care utilization in some key areas. We observe a robust effect of parental high-intensity drinking on the likelihood of a child's visit to the pediatrician and also find some evidence of increases in the number of pediatric visits and ER use.

**Conclusions:** Understanding and quantifying the costs of parental alcoholism on children are critical to the design of treatment interventions and other policies that can improve the well-being of children of alcoholics. While children's insurance coverage and advances in medical treatment receive important attention in the United States, more emphasis should be placed in addressing the determinants of children's health that stem from parents' health-related behavior.

**Key Words:** alcohol misuse; alcohol-related consequences; adolescent health care; children of alcoholics

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## Acknowledgements

Financial assistance for this study was provided by research grants from the National Institute on Alcohol Abuse and Alcoholism (R01 AA15695 and R01 AA13167) and the National Institute on Drug Abuse (R01 DA018645).

We gratefully acknowledge Allison Johnson, Carmen Martinez, and Zuzer Calero for editorial and administrative assistance, and Eugenia Rivas for valuable research assistance. The authors are entirely responsible for the research and results reported in this paper, and their position or opinions do not necessarily represent those of the Universidad de Montevideo, the University of Miami, National Institute on Alcohol Abuse and Alcoholism, or the National Institute on Drug Abuse.



# **The Impact of Parental Drinking on Children's Use of Health Care**

## **INTRODUCTION**

Approximately one in four children in the United States is exposed to alcohol abuse or alcohol dependence in the family before reaching the age of 18 (Grant, 2000). Children of alcoholics (COAs) are at a higher risk of: (1) developing mental health problems (Bennett et al., 1988a; Harden and Pihl, 1995; Nordberg et al., 1993); (2) engaging in violent and delinquent behavior (Giancola et al., 1996; Widom and Hiller-Sturmhofel, 2001); (3) being physically abused (Walsh et al., 2003); (4) performing poorly in school (Casas-Gil and Navarro-Guzman, 2002; McGrath et al., 1999; Morey, 1999); (5) abusing alcohol or drugs (Jacob and Windle, 2000; Jennison and Johnson, 1998; Webb and Baer, 1995; Windle and Windle, 1996); and (6) experiencing depression in adulthood (Anda et al., 2002).

Surprisingly, studies of the economic costs of alcoholism rarely consider outcomes involving COAs. For instance, the latest National Institute on Alcohol Abuse and Alcoholism (NIAAA) report to the U.S. Congress on Alcohol and Health (National Institute on Alcohol Abuse and Alcoholism, 2000) estimates the costs of alcohol consumption on the basis of excessive health care use, productivity losses, and various additional costs directly incurred by persons affected by problem drinking. But, the report does not consider children and the economic consequences that parental alcoholism inflicts upon them.

Some studies have reported associations between parental alcoholism and children's use of health care. Roberts and Brent (1982) find that individuals with an alcoholic family member have higher utilization rates of primary care services. Using health insurance claims, Woodside et al. (1993) show that COAs are twice as likely to be hospitalized for substance abuse problems than non-COAs, 1.5 times more likely to be admitted for mental illness, and 1.3 times more likely to be hospitalized for injuries and poisonings. Dobkin et al. (1994) also find a positive relationship between fathers' alcohol-related diagnoses and children's use of mental health services.

Many existing studies on this topic have been criticized for using small samples or failing to control for unobserved characteristics that could be associated with parental drinking and children's health. When using mother-child fixed effects to control for family-related unobserved heterogeneity over time, Chatterji and Markowitz (2001) fail to find a consistent effect of alcohol use on children's behavioral health. Conversely, Jones et al. (1999) use two-stage least-squares techniques to provide evidence that parental alcohol misuse is an input with negative marginal product in the production of children's behavioral health.

In this paper, we study the contemporaneous effects of parental drinking on children's use of health care by using propensity score matching on a nationally representative sample (i.e., National Health Interview Surveys) of parent-child pairs pooled across 7 years (2002-2008). The use of matching methods improves upon standard multivariate regression by comparing individuals with similar backgrounds on the observable characteristics and by not relying on a particular functional form (Luo et al., 2010).

Because we lack diagnostic information about alcohol use disorders (e.g., abuse and/or dependence), throughout the paper we use the terms *alcohol misuse* and *at-risk drinking* interchangeably to indicate parental drinking patterns that may adversely affect children. We interpret alcohol misuse or at-risk-drinking as a maladaptive use of alcohol that may result in cognitive, behavioral, and/or physiological symptoms. Individuals who misuse alcohol may experience various social, legal, family, and physiological complications and may ultimately become dependent on alcohol.

## THE DEMAND FOR PEDIATRIC HEALTH CARE

### *Pediatric Health Care Use and Parental Alcohol Misuse*

Use of pediatric health care has been associated with a child's physical and mental health status (Chan et al., 2002; Guevara et al., 2003; Lavigne et al., 1998), demographic characteristics (Riley et al., 1993), access factors (Andersen, 1995), family size (Colle and Grossman, 1978; Riley et al., 1993), family structure (Case and Paxson, 2001), parental health care use (Janicke et al., 2001; Riley et al., 1993), and parent and family functioning (Riley et al., 1993). In particular,

maternal psychopathology and family structure have been found to influence the decision-making process of seeking health care for children. Minkovitz and colleagues have found that maternal depressive symptoms in early infancy result in unfavorable patterns of children's health care use (Minkovitz et al., 2005). Case and Paxson (2001) demonstrate that children living with stepmothers make worse health investments than children living with their biological mothers.

Following Becker and Grossman (Becker, 1965; Grossman, 1972), we base the framework of the present paper on the premise that alcohol-misusing parents allocate scarce resources to two competing goals: the parent's own alcohol consumption and the children's well-being (i.e., physical and mental health status). Children's health is produced at home and depends on the child's genetic endowment, the quantity and quality of the parent's time investment, and market-purchased inputs such as medical services, food, clothing, and housing.<sup>1</sup>

Parents who misuse alcohol are likely to assign more time and financial resources to alcohol consumption than to other goals. In particular, they are likely to devote less time to their children, and the quality of their time investment is likely to be inferior. Families of alcoholics are characterized by higher levels of conflict and stress, lower levels of cohesion, and hostile communication patterns (El-Guebaly and Offord, 1977; Hussong et al., 2008; Jacob and Seilhamer, 1989), all of which have been associated with psychopathology and other behavioral problems in children (Bennett et al., 1988b; Nordberg et al., 1993; Reich et al., 1993). Child neglect, as reflected in unhealthy and irregular meals, lack of bedtime routines, or inadequate clothing may also be more prevalent when one or both parents misuses alcohol (Bennett et al., 1988b). In addition, parental alcohol misuse may impair a child's physical health since COAs face higher risks of injuries, burns, and other accidents (Roberts and Brent, 1982; Woodside et al., 1993) due to lower levels of supervision. Furthermore, stress suffered by children at home may incite physical conditions such as enteritis, colitis, and asthma (Roberts and Brent, 1982). Alcoholic parents may

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<sup>1</sup> The corresponding author will provide a formal model of these relationships upon request.

also harm their children directly through violence or abuse. Finally, COAs are more likely to abuse substances and suffer mentally and physically from such abuse.<sup>2</sup>

This conceptual background suggests that parental at-risk drinking has an ambiguous effect on the demand for pediatric health care. One mechanism predicts that parents will use pediatric medical care as a substitute for the lower productivity of their own time with their children. Alcohol misuse reduces the quality and quantity of time that parents spend with their children and hence their children's health status. To produce a given unit of children's health, parents must increase health care purchases while reducing their own, less productive time with their children. Several studies on the relationship between parental mental health and child health care use suggest that if a parent views health care as a viable source of assistance, he or she is more likely to seek pediatric consultation when experiencing personal mental health difficulties (Janicke and Finney; 2000).<sup>3</sup> In addition, the parent misusing alcohol may not always be the one who makes the medical decisions at home. In fact, fathers are more likely to misuse or abuse alcohol than mothers, but mothers are usually the decision makers regarding their children's health care. The deterioration in the child's health status resulting from one parent's misuse of alcohol acts as a negative externality on the sober parent's utility. This shock is likely to increase the sober parent's demand for pediatric health care for his/her children.

The same factors that cause parents to reduce the quantity and quality of time they devote to their children may also lead them to neglect medical and mental health care for their children. As mentioned above, parents who place high value on alcohol consumption will have less time and fewer financial resources to allocate to their children. In particular, they are likely to assign fewer resources to the purchase of pediatric health care, miss appointments, and fail to comply with

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<sup>2</sup> In this paper, we analyze a sample of children aged 11 or younger to isolate the health consequences that are not mediated by the use/abuse of substances.

<sup>3</sup> This effect will be modest in a pure, rational model of alcohol consumption or addiction in which parents choose a drinking status together with a certain level of health for their children. In this framework, the parent misusing alcohol is willing to accept lower levels of health for his/her children as a trade-off for the higher satisfaction he/she gets from alcohol consumption. The increase in the demand for children's health care should be stronger in this situation since parents are myopic or time-insensitive regarding the adverse effect of their consumption of alcohol on their children. These models are more aligned to the concepts of alcohol abuse and alcoholism as clinical disorders.

recommended treatments, all of which are behaviors that decrease the demand for pediatric health care.

Hence, the contemporaneous effect of parental alcohol misuse on the demand for children's health care is an empirical matter that depends on the relative strengths of the substitution and medical-neglect effects, the type of health care being consumed, and the specific family characteristics that either protect or endanger the child.

#### *Risk and Protective Factors Associated with Parental Risky Drinking*

Recent economic models of the family as the producer of health claim that the distribution of health resources among family members depends on the family's joint resources as well as the family structure, the degree of specialization within the family (i.e., household vs. market production), and the regulations associated with divorce (i.e., the pressure point in a bargaining process) (Bolin et al., 2001; Jacobson, 2000). Following these paradigms, it is reasonable to expect that household characteristics can either reinforce or moderate effects of parental alcoholism on children's health and health investments. Researchers have identified many characteristics that differentiate families with alcoholics from families without alcoholics and that place children of alcoholics at risk of developing mental health and substance abuse problems (Ellis et al., 1997). High-risk environments may be characterized by more severe alcohol-use patterns by parents, both parents succumbing to alcohol and/or other substance abuse, a parent affected with comorbid psychopathology, lower parental intellect, higher rates of aggression toward children or violence between parents, and lower socioeconomic status. In this analysis, we consider the following risk factors: family structure (intact family, single adult family, family with a step-parent or other extended family, and number of children in the household); the family's socioeconomic status (parental education, employment status, and welfare benefits); age of parent and child; gender; race/ethnicity; and foreign birth status.

*Family structure.* A growing literature emphasizes the importance of family relationships in the socio-emotional development of children. Factors associated with family functioning (e.g., acknowledgment or support when the child assumes family responsibilities, parental conflict)

significantly influence the adverse effects of parental alcohol misuse on children's behavioral health (Godsall et al., 2004). These studies suggest that the adverse effects of parental alcohol misuse are likely to be milder when a non-misusing parent attends to family issues. Children of at-risk drinkers living in intact families (families with both biological parents in the household) should be better off in terms of health status than children of at-risk drinkers in non-intact families. Also, children of intact families should be less likely to experience medical neglect and more likely to receive needed care.

*Household socio-economic status.* Economic disadvantage is associated with higher rates of psychopathology in children because it exposes them to major stressors. It is also associated with a greater prevalence of alcohol and other substance-use disorders in parents. We expect low-income status to aggravate the effects of parental alcohol misuse on children. Since economically disadvantaged families face more binding resource constraints, medical neglect is also likely to be a more serious issue. Families with higher incomes are less likely to compromise financial resources for children and are better able to substitute parental time with other types of services that partially compensate for parental neglect. We approximate socioeconomic status by using controls for parental education, parental employment status, and indicators of receipt of welfare benefits.

*Gender and age.* Some patterns emerge when examining health care use among children between the ages of 0-11. Infants and toddlers are more likely than other children to have regular check-ups, use ERs, or be hospitalized. On the other hand, older children are more likely to use dental and mental health care. The type of impact of parental drinking on children's health is also associated with the gender of both the drinking parent and the child. A recent study found that daughters of alcohol-misusing parents had a higher likelihood of mood or anxiety disorders such as major depression, while conduct disorders, pathological gambling, substance abuse, and personality disorders were more common among sons of alcoholics (Morgan et al., 2010).

*Race/ethnicity.* As studies have demonstrated, race and ethnicity impact individual beliefs about the effects of alcohol (Johnstone, 1994). Therefore, cultural background may moderate or reinforce the adverse effects of parental alcohol misuse on children.

## DATA

The National Health Interview Survey (NHIS) is the principal source of information on the health of the civilian, non-institutionalized, household population in the United States (National Center for Health Statistics, 2002). We work with a subset of the NHIS data consisting of one adult and child per household randomly selected to participate in the NHIS Adult Core and Child Core questionnaires. From the Adult Core, we obtain information about alcohol consumption; from the Child Core, we obtain information about children's health status and health care use. The Person and Family Core provides socio-demographic characteristics and basic indicators of health status, family structure, activity limitations, injuries, health insurance coverage, as well as some limited information on access to and use of health care for all people in the family. We pool seven years of NHIS surveys: 2002 - 2008.

We chose to analyze children younger than 12 because they are less likely to consume alcohol themselves and are therefore more likely to be affected by alcohol through their parents' consumption. Our working sample consists of 65,926 pairs of adults and children, comprised of 41,098 mother-child pairs and 24,828 father-child pairs. The higher prevalence of mother-child pairs is a consequence of selecting only those adults who live with at least one child in the household, as there are more single adult households in the women's sample than in the men's.

The NHIS asks several questions related to children's use of health care. An adult in the household is responsible for answering these questions. Because mothers are more likely to be in charge of children's health care needs, misreporting may be higher among male respondents. For this reason, the analysis controls for the person who responded to the child's questionnaire. Our main dependent variables are a dichotomous indicator of whether the child saw a general practitioner (GP) physician in the past year, an indicator variable for three or more GP visits in the past year, and an indicator for any emergency room (ER) visit during the past year.

NHIS asks adult respondents about the frequency and intensity of their alcohol use in the past year, but it does not contain diagnostic information on alcohol abuse and/or dependence. We constructed a variety of measures of alcohol misuse based on levels exceeding certain pre-defined

thresholds of frequency, intensity, and total number of drinks. Initial analyses revealed that children's health care use was associated with a high intensity of parental alcohol use but not with high frequency. Thus, we define our main explanatory variable as one if the mother reported consuming four or more drinks or the father reported consuming five or more drinks on average in a single drinking episode during the past year, and zero if otherwise.

The variables we chose to account for family and household characteristics are family size, family structure, and receipt of welfare benefits. Family structure distinguishes among intact families (families in which both parents are present), single-adult families, families with one step-parent, and extended non-intact families. Welfare benefits include indicators for use of Head Start, receipt of Welfare/TANF benefits, receipt of WIC benefits, and receipt of food stamps. For parental characteristics, we consider age, race and ethnicity, parental education (less than high school, high school, college, and graduate studies), and parental work status. We also include parental smoking status as a proxy for health investment preferences and former drinking status to distinguish this group of non-drinkers from lifetime abstainers. Children's characteristics include age, gender, insurance status, Medicaid enrollment status, and plan type (HMO vs. indemnity).

Table 1 shows the variable means for the sample of father respondents (Columns 1-4) and mother respondents (Columns 5-8). In this table, we compare high-intensity drinkers with other same-gender parents to assess characteristics of potentially at-risk drinking parents. Children of women who drink more than four drinks per episode are more likely to visit a pediatrician both at the intensive and extensive margins. Children of men who drink more than five drinks per episode are also more likely to use pediatric services at the intensive margin. High-intensity drinking parents are younger, more likely to be Hispanic in the case of men, more likely to be White in the case of women, and are more common in the Midwest. They are less likely to have finished high school and to have an intact family. They smoke more and are more likely to be welfare recipients. Children of high-intensity drinkers are younger, less likely to be privately insured, and more likely to be on Medicaid.

## EMPIRICAL STRATEGY

We use propensity score matching (PSM) techniques to estimate the association between parental alcohol misuse and children's use of health care services. This method compares a group of "treated" individuals (parents classified as high-intensity drinkers) with a group of "untreated" individuals who are similar in a number of characteristics to those in the treated group but differ in their alcohol intake. PSM can address some of the limitations associated with multivariate regression models both by using a non-parametric approach that does not rely on functional form assumptions and by statistically selecting a subset of untreated individuals for whom the distribution of covariates is similar to the distribution in the treated group (Rosenbaum and Rubin, 1983; Rubin, 1974). Although this technique will not mimic the virtuous statistical properties of a randomized controlled trial (i.e., important unmeasured or unobserved factors could still create bias if they are orthogonal to the included controls), PSM, when performed properly with quality data, not only enables researchers to make valid comparisons between treated and untreated individuals but also produces estimates that perform well when compared to experimental designs (Heckman et al., 1997; Luo et al., 2010; Michalopoulos et al., 2004; Rosenbaum and Rubin, 1983; Smith and Todd, 2001).

To execute PSM, we first used a set of individual, family, and regional controls to estimate each parent's propensity for being classified as a high-intensity drinker. In the second stage, we matched each treated individual with one or more untreated individuals who had similar propensity scores, producing a new, balanced control group that did not differ systematically from the treated group in terms of the selected controls. We tested the balance of these characteristics across treated and untreated individuals by using t- or z-tests, and statistical matching was satisfied in all cases (we will provide results of these tests upon request). Finally, for each health-care-related outcome, we computed the mean difference between the treated and untreated groups, or what is known in the literature as the average treatment effect on the treated (ATT). We used the command *psmatch2* in Stata version 9 to estimate propensity scores, match treated with untreated individuals, test the balance of the treated and untreated groups, estimate the differences in the outcomes of interest, and compute standard errors.

To form the untreated group, we used nearest neighbor matching with three neighbors ( $k=3$ ) as our default matching criterion. This method matched each treated individual with the three untreated neighbors who had the closest propensity scores. We computed standard errors analytically in the core models and bootstrapped them for robustness. In addition, we tested for robustness by using other matching algorithms: single nearest neighbor with and without replacement, and nearest neighbor matching with five neighbors.

Choosing the right control variables is one particular challenge of successfully executing PSM. Unintentionally omitting variables that simultaneously determine treatment and outcomes can severely bias the estimates (Heckman et al., 1997). On the other hand, the set of adjustors should only include variables that are unaffected by participation or the anticipation of participation (Smith and Todd, 2005). For example, variables such as tobacco use and occupational status may be good predictors of an individual's propensity to misuse alcohol. These variables should be included as controls in propensity score estimation if they co-occur with alcohol intake due to some unobserved underlying characteristic(s) of the individual. However, if drug use and working status are consequences of alcohol misuse, including them in the PSM first-stage regression may bias the overall effect of alcohol use on the outcomes of interest. Because we were unable to establish whether these variables preceded treatment or were unrelated to treatment anticipation, we used a hierarchical approach to selecting controls. In particular, we computed PSM estimates for two sets of controls, beginning with a parsimonious group of arguably exogenous measures (i.e., demographics, regional characteristics, and parental education). We then added measures that are less likely to precede the treatment decision to be a high-intensity drinker (i.e., parental smoking and former drinking status, family structure, parental working status, receipt of welfare benefits, and child's insurance status). In a sensitivity analysis, we also considered children's and parents' health status measures as adjustors for the propensity score.<sup>4</sup>

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<sup>4</sup> Our core models do not control for the health status of the child because we want to study the full cost that parental drinking imposes on children's use of care, including the direct impact on children's physical and mental health. Likewise, we do not control for parental mental health due to its correlation with parental drinking status (Saffer and Dave, 2005). We still adjust for child's and parent's health status as a sensitivity check.

In addition to running the PSM analysis for the full sample, we conducted separate analyses for the sample of mother respondents, father respondents, girls only, and boys only. The literature provides numerous examples of gender differences in drinking patterns (Hupkens et al., 1993; Robbins and Martin, 1993; Wilsnack and Wilsnack, 2002), as well as some evidence on the gender-specific effects of parental alcoholism on children's health (Morgan et al., 2010).

## RESULTS

Table 2 shows the average effect of parental alcohol misuse on the probability that a child with a problem-drinking parent will see a pediatrician (average treatment effect on the treated, or ATT). We first selected treatment and control pairs of parents and children who were similar in age, gender, race, region of residence, survey year, and parental education. We then compared how the probability of a child visiting the pediatrician changed as these similar parents became high-intensity drinkers (Column 1). Results for the full sample show that intensive use of alcohol by a parent is associated with an increase of 2.8 percentage points (3 percent) in the likelihood of the child visiting a pediatrician. The ATT is 0.04 for children of mothers who drink intensively and 0.03 for children of fathers who drink intensively. The ATT is higher (0.03) and more significant for female children of problem drinkers than for male children.<sup>5</sup> The second column in Table 2 includes the controls in Column 1 and adjusts the parent's propensity for being a high-intensity drinker by parental smoking and former drinking status, likelihood of receiving welfare benefits, and child's health insurance, characteristics that are arguably more likely to be determined endogenously than those used in Column 1. The new estimates are slightly smaller in magnitude than the previous ATT estimates, but they are still positive and significant (with the exception of the estimates for the subsample of boys). For example, the ATT for the full sample is 0.025 (an increase in the likelihood of a pediatric visit of about 3 percent), and the ATT for girls remains approximately 0.03. The last column in Table 2 also adjusts for children's health (overall health as

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<sup>5</sup> Note that the estimated effects for the full sample are not necessarily the averages of the effects for the father and mother subsamples because we compute the ATT on the treated group only. Thus, the estimates we observe for each subsample capture changes in the effects per se as well as in the distribution of observed characteristics among the treated individuals.

reported by the parent, mental health problems, number of chronic conditions, and an indicator of low birth weight) and parent's health (self-reported health status and an indicator of mental health problems). We include this last column as a sensitivity check only: the estimates in these specifications would only capture the ATT of interest if the included health conditions predated parents' decisions to become high-intensity drinkers, a rather strong assumption. However, even under this strong assumption, our results show a statistically significant and positive effect of parental problem drinking on the probability of a pediatric visit.

Table 3 shows the effects of parental alcohol misuse on the likelihood of having more than three pediatric office visits. Results for the full sample and the more parsimonious set of controls (Column 1) show an ATT of 0.025. The ATT for boys is positive (0.027) and also significant at  $p < 0.05$ , but effect sizes are smaller in size and less significant when we analyze other subsamples. The ATT for the full sample remains robust after we adjust for parental smoking and former drinking status, welfare status, and child's health insurance. However, the ATT for male children of high-intensity drinkers loses significance (at  $p < 0.05$ ) in this specification. Most effects disappear after we adjust the propensity score for parental and children's health status.

Table 4 shows ATT estimates of parental alcohol misuse on the likelihood of the child visiting the ER. When adjusting the propensity score for the more parsimonious set of controls, we observe positive, statistically significant, and sizeable effects of having a high-intensity drinking father or mother. For example, having a high-intensity drinking mother is associated with an increase in ER use of 3.9 percentage points (16 percent), and having a high-intensity drinking father is associated with an increase in ER use of 2.7 percentage points (14 percent). Once we adjust propensity scores for parental working status, health insurance, family structure, and other health behaviors, the effects lose significance and decrease in magnitude. These findings suggest that the association between parental drinking and children's ER use could be mediated by effects of drinking on parental employment, health insurance, and family structure. But the reverse explanation is also plausible if problems with employment and family structure lead to parental drinking. In the latter case, drinking per se would not affect pediatric ER use.

To verify the stability of these results to our matching method, we re-estimated the ATTs under several alternative matching methods, including: one-on-one matching (i.e., matching to the nearest neighbor) with and without replacement; matching to the nearest three neighbors, as in the core analysis, but with bootstrapped standard errors; and matching to the five nearest neighbors. Results were similar to those in Tables 2-4 and will be provided upon request.

## DISCUSSION AND CONCLUSION

Despite substantial research documenting the negative effects of parental alcohol misuse on children, economic estimates of the costs of alcohol abuse on society have rarely taken these consequences into consideration. Studying the costs of parental alcohol abuse on children is crucial for treatment and policy design, the allocation of funds to competing treatments, and the evaluation of treatment programs. Growing evidence suggests that mental health and behavioral and social problems induced by parental heavy drinking can be minimized or prevented by appropriate educational and social interventions (Kumpfer et al., 1997). A survey conducted by the National Association for the Children of Alcoholics found that 69 percent of treatment providers do not offer services to the school-aged children of their patients. The same survey found that lack of funding was the most frequently cited barrier to program implementation or expansion (Stoil, 1999).

In this paper, we provide new evidence that alcohol consumption at the family level is positively associated with children's health care utilization in some key areas. Specifically, we observe a robust effect of parental high-intensity drinking on the likelihood that a child will visit a pediatrician. We also find some evidence of increases in the number of pediatric visits and ER use, but these estimates are less robust to alternative causal interpretations.

Our findings support the hypothesis that parental alcohol misuse increases the demand for pediatric medical care either because of higher morbidity among children of problem drinkers (Bennett et al., 1988b; Nordberg et al., 1993; Reich et al., 1993) or because parents use pediatric health care as a substitute for the low productivity of their own time with their children (Janicke and Finney, 2000). Our results are not based on clinical measures of abuse or dependence but rather on a self-reported measure of intensity of alcohol use. Thus, these findings may

underestimate the underlying effects if parents underreport their levels of drinking. In addition, the true effects could be stronger for parents with more severe alcohol-related problems such as alcohol dependence.

A positive feature of our analysis is that we employ a nationally representative data set and use propensity score matching techniques to construct counterfactual families with no problem-drinking parents. Our estimates are robust to alternative definitions of these control groups, using different matching strategies and different combinations of observable characteristics.

Interestingly, the association between maternal alcohol misuse and the probability of a pediatric visit disappears after jointly accounting for the child's and mother's health status, while the effect of paternal alcohol misuse remains insensitive to jointly controlling for the child's and father's health. This result is consistent with prior literature showing that a mother's perception of her child's health is associated with her own self-reported health (Waters et al., 2000) and that maternal emotional functioning influences the decision-making process involved in seeking health care on behalf of children (Janicke et al., 2001).

We also find that the effects of parental drinking on the probability of a visit to the pediatrician are stronger and more robust for girls than for boys, suggesting that either girls' health status is more affected by parental alcohol misuse (at least up to the age of 12) or alcohol misusing parents perceive the health needs of their male and female children differently. This finding is in line with results from a recent study showing that female children of alcoholic women face the highest risks of developing psychiatric illnesses (Morgan et al., 2010). Morgan and colleagues also find that female children of alcoholics are more likely to develop mood or anxiety disorders whereas males are more likely to develop conduct disorders. Thus, our results may indicate that parents are more likely to seek help from a pediatrician for anxiety disorders than for conduct disorders.

Our estimation strategy relies on controlling for selection on the basis of observables, but the results could still be biased by characteristics related to both parental alcohol use and children's health status that we are unable to observe and/or measure. Consequently, these findings are not

necessarily causal, although the robustness of our estimates, in particular those associated with pediatric visits, suggests a direction of causality running from parental alcohol misuse to children's health care use. Also, the static nature of the analysis renders it unable to determine whether any health effects and resulting uses of health care are true deficits or simply reflect developmental delay (Johnson and Leff, 1999).

Based on these findings, we encourage future research to directly address the economic costs of parental alcoholism on COAs' lifetime productivity, health, health care use, and engagement in criminal activities. Understanding and quantifying these costs and adding them to aggregate estimates of the costs of alcoholism are critical for securing funding and designing treatments and other interventions that can improve the well being of COAs. While children's insurance coverage and advances in medical care technology receive important attention in the United States, more emphasis should be placed on addressing the determinants of children's health that stem from parents' health-related behavior (Case and Paxson, 2002).

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**Table 1: Variable means <sup>a</sup>**

	<i>Father respondent</i>				<i>Mother respondent</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Full sample	High intensity drinkers	Other fathers	Diff <sup>b</sup> (2)-(3)	Full sample	High intensity drinkers	Other mothers	Diff <sup>b</sup> (6)-(7)
<b>Health Care Use</b>								
Saw pediatrician past year	0.784	0.783	0.788		0.794	0.814	0.795	***
Number pediatric visits > 3	0.315	0.336	0.315	**	0.327	0.358	0.326	***
ER visit	0.202	0.227	0.200	***	0.229	0.283	0.226	***
<b>Alcohol Use</b>								
High-intensity drinker	0.119	1.000	0.000		0.065	1.000	0.000	
<b>Parental and Household Characteristics</b>								
Parent's age	38.673	34.528	39.247	***	36.954	32.853	37.269	***
White	0.555	0.487	0.566	***	0.496	0.602	0.489	***
Hispanic	0.271	0.424	0.249	***	0.267	0.257	0.269	*
Black	0.113	0.054	0.120	***	0.182	0.102	0.187	***
Other race	0.062	0.034	0.065	***	0.054	0.040	0.055	***
Northeast	0.133	0.112	0.135	***	0.143	0.144	0.142	
Midwest	0.184	0.212	0.180	***	0.175	0.249	0.170	***
South	0.297	0.292	0.299		0.316	0.269	0.319	***
West	0.220	0.225	0.219		0.205	0.182	0.208	***
Former drinker	0.358	0.334	0.359	***	0.313	0.321	0.312	
Smoker	0.236	0.449	0.206	***	0.202	0.517	0.179	***
High school dropout	0.243	0.398	0.221	***	0.245	0.293	0.242	***
High school graduate	0.420	0.452	0.414	***	0.436	0.505	0.430	***
College graduate	0.248	0.136	0.265	***	0.257	0.189	0.263	***
Graduate studies	0.089	0.015	0.100	***	0.062	0.014	0.066	***
Number of children	1.913	1.930	1.912		1.940	1.916	1.943	*
Intact family	0.537	0.431	0.552	***	0.381	0.256	0.391	***
Single-parent family	0.060	0.066	0.059	*	0.266	0.357	0.259	***
One step-parent family	0.140	0.208	0.131	***	0.101	0.160	0.097	***
Other types of family	0.262	0.294	0.257	***	0.251	0.226	0.253	***
Parent's working status	0.578	0.577	0.577		0.429	0.461	0.425	***
Head Start	0.214	0.274	0.207	***	0.269	0.319	0.266	***
TANF recipient	0.027	0.035	0.026	***	0.063	0.087	0.061	***
WIC recipient	0.128	0.218	0.115	***	0.155	0.180	0.153	***
Food Stamps	0.087	0.143	0.079	***	0.180	0.267	0.173	***
<b>Children's Characteristics</b>								
Male	0.522	0.524	0.521		0.510	0.522	0.509	
Age	8.629	8.053	8.704	***	8.545	8.212	8.573	***
Medicaid	0.171	0.244	0.160	***	0.261	0.319	0.256	***
Private insurance	0.647	0.516	0.666	***	0.536	0.469	0.542	***
N	24,828	2,851	21,199		41,098	2,631	37,551	

<sup>a</sup> Data Source: National Center for Health Statistics (NHIS 2002-2008).

<sup>b</sup> Difference between high-intensity drinkers and other individuals: t-test for continuous variables and chi-squared test for dichotomous variables. Difference is \* significant at p<0.10; \*\* significant at p<0.05; \*\*\* significant at p<0.01

**Table 2: ATT Propensity Score Estimates for the Effects of Parental Alcohol Misuse on the Likelihood of a Pediatric Office Visit**

	(1)	(2)	(3)
	Parsimonious set of controls <sup>a</sup>	(1) + health behaviors, family structure, employment status, welfare, insurance	(2) + parent's and children's health status
Full sample	0.028*** (0.008)	0.025*** (0.009)	0.019** (0.009)
Father respondent	0.034*** (0.011)	0.029** (0.012)	0.028** (0.013)
Mother respondent	0.040*** (0.011)	0.025** (0.012)	0.019 (0.012)
Girls only	0.034*** (0.011)	0.029** (0.012)	0.021* (0.013)
Boys only	0.021* (0.011)	0.018 (0.012)	0.012 (0.011)

<sup>a</sup> Socio-demographics, parental education, region, and year

\* p<0.10; \*\* p<0.05; \*\*\* p<0.01

Standard errors in parentheses

**Table 3: ATT Propensity Score Estimates for the Effects of Parental Alcohol Misuse on the Likelihood of Having More than Three Pediatric Office Visits**

	(1)	(2)	(3)
	Parsimonious set of controls <sup>a</sup>	(1) + health behaviors, family structure, employment status, welfare, insurance	(2) + parent's and children's health status
Full sample	0.025** (0.010)	0.023** (0.011)	0.015 (0.011)
Father respondent	0.027* (0.014)	0.029* (0.016)	0.017 (0.016)
Mother respondent	0.013 (0.014)	-0.005 (0.016)	-0.005 (0.016)
Girls	0.020 (0.014)	0.029* (0.016)	0.029* (0.016)
Boys	0.027** (0.014)	0.011 (0.015)	-0.005 (0.014)

<sup>a</sup> Socio-demographics, parental education, region, and year

\* p<0.10; \*\* p<0.05; \*\*\* p<0.01

Standard errors in parentheses

**Table 4: ATT Propensity Score Estimates for the Effects of Parental Alcohol Misuse on the Likelihood of an Emergency Room Visit**

	(1)	(2)	(3)
	Parsimonious set of controls <sup>a</sup>	(1) + health behaviors, family structure, employment status, welfare, insurance	(2) + parent's and children's health status
Full sample	0.038*** (0.009)	0.005 (0.010)	0.006 (0.010)
Father respondent	0.027** (0.012)	0.011 (0.014)	-0.017 (0.015)
Mother respondent	0.039*** (0.013)	0.013 (0.014)	-0.003 (0.015)
Girls only	0.047*** (0.013)	0.013 (0.014)	0.005 (0.015)
Boys only	0.017 (0.013)	-0.008 (0.014)	-0.005 (0.013)

<sup>a</sup> Socio-demographics, parental education, region and year

\* p<0.10; \*\* p<0.05; \*\*\* p<0.01

Standard errors in parentheses