Detailed summaries of peer-reviewed journal articles with Alison Snow Jones as primary author

by Lauren Bruce

1.Snow Jones, A, Lillie-Blanton, M, Stone, VE, Ip, E, Zhang, Q, Hessol, NA, Wilson, TE, Cohen, MH, Golub, ET, Hessol, NA. (2010). Multi-Dimensional Risk Factor Patterns Associated with Non-use of HAART among HIV-Infected Women Women's Health Issues, 20(5): 335-342.

Introduction and background: Since the introduction of highly active anti-retroviral therapy (HAART) there has been increasing evidence of lower use of antiretroviral therapy by women of color compared with other women. One possible reason is difference in access to quality medical care and ART. Prior research has also shown that risk factors, such as alcohol abuse and depression, which may vary over time, are associated with HAART nonuse in medically eligible women. However, many risk factors occur simultaneously, suggesting they may cluster and in certain combinations may be a marker for underlying unobserved or latent states that give rise to both the risk factors and to non-use of HAART.

This study used data from the Women's Interagency HIV Study (WHIS) to investigate the association between non-use of HAART and latent states characterized by clusters of risk factors among HIV-infected women. The authors used an extended version of the multivariate discrete hidden Markov model (HMM) to capture the complexity of possible complex patterns of concomitant factors (ie: illicit drug use, heavy alcohol use, multiple male partners, unprotected anal or vaginal sex, and exposure to physical violence) and to model the underlying unobserved dynamic process that may give rise to complex observed risk factor patterns that vary over time and are associated with HAART non-use.

Methods: Women were enrolled in several waves in 1994, 1995, and 2005. The study population was limited to a subset of HIV-infected women, who self-identified their race/ethnicity, who were ever clinically eligible for HAART between study enrollment and 23rd visit, based on criteria used in a prior WHIS study of either a) Current use of HAART, b) CD4+ count <350cells/uL or, c) HIV RNA >50,000 copies/mL.

Study population: The final sample of 802 included HIV-infected women who were HAART eligible, from both waves who had consistently attended visits and had data available during a four-year period. Five risk factors during four years yielded 20 possible time-risk factor indicators for each participant. The main outcome was self-reported HAART use since last visit (y/n). The term "non-use" was used to mean women who reported that their main reason for not taking HAART was that their physician did not prescribe it, as well as women who reported other reasons for not taking HAART. In addition, women who used HAART only once during the recall period were assigned to the use category. Blood samples were tested at each semi-annual visit for HIV RNA quantification and CD4+ cell count.

Risk factors: Five risk factor indicators were based on responses to questions about the six months prior to the interview. Binary indicators were created for illicit drug use, heavy drinking, sexual risk factors, and recent physical violence. Latent states were characterized by patterns of the conditional probabilities of five observed binary indicators of risk that could occur in any combination in the six months before the interview: 1)experienced any physician violence by a spouse, partner, family member, acquaintance, or stranger, 2)having more than one male partner, 3)use of crack, cocaine, or heroin, 4)heavy drinking defined as more than 13 drinks per week and 5)unprotected vaginal or anal sex with a male. At any given follow-up visit, a woman might report all five risk factors and be coded a 1 on

each of them or she might report none of the factors and be coded a 0 on each. 32 combinations of the five factors were possible.

HMM: The impact of time-varying factors on HAART non-use was investigated using two regression-based method. The first method used the underlying latent state of an individual at each time point, derived from the HMM approach, as predictor. The authors used this to investigate whether or not several risk factors that had been demonstrated in previous research to be individually associated with HAART use and non-use might in fact proxy an underlying individual state that is associated with HAART non-use. A second method was used as comparison, using each of the risk factors as a main effect.

Results: Of the five risk factor main effects, none demonstrated significantly elevated odds but three demonstrated both higher odds and 95% CIs that barely cover 1 with relatively high upper bounds.

The four risk profiles consisted of one characterized by high probabilities of all five risk factors (state 1), another characterized by elevated probabilities of heavy drinking and exposure to violence and slight elevations in probabilities of the remaining three risk factors (state 3), one with high probability of unprotected sex (state 2), and a fourth profile with low probabilities of all five risk factors (state 4). The high probabilities of transitioning to state 1, the profile with high probabilities of all risk factors, from all other risk profiles were quite low or zero.

Discussion/Conclusion: The results indicate that risk factors that influence HAART use in HIV-infected women may be multidimensional, complex and dynamic. Generalized estimating equations (GEE) analysis indicated that the only risk profile associated with non-use of HAART was state 3, characterized primarily by elevated probabilities of heavy drinking and recent physical violence. The other three individual risk factors (crack, cocaine, heroin use; unprotected sex; and multiple male partners) had conditional probabilities that were relatively low in this latent state. At the same time, the effects of other covariates such as race and insurance remained relatively stable.

The relative stability of the HMM states indicated by the transition probabilities suggests that not much can be gained by modeling risk factors dynamically in a population of HIV-infected women similar to this sample. However, future research may find more variation in risk factors in younger women which could result in more informative HMM results.

The general trend in this sample was for women to move toward a lower risk state over time –state 4- regardless of race/ethnicity, reducing or eliminating risk factors that have been linked in previous research to HAART non-use. There is no way to know if this is a general trend among HIV-infected women or specific to those who participated in this longitudinal study but it warrants further investigation.

Overall, identification of state 3, characterized by heavy drinking and recent physical violence suggest a more nuanced profile of women at risk for non-use of HAART. To help service providers in improving HAART use, future research should investigate risk factor clusters, especially ones associated with heavy drinking, in younger, HIV-infected women, the trajectories associated with them and the causal mechanisms if any of their impact on HAART use and non-use.

2. Jones A.S., & Frick, K. (2010). Commentary: The Roles of Women's Health and Education in Family and Societal Health. *Women's Health Issues*, 20 (4), 231-233.

This commentary is a follow-up to a previous editorial by the two authors about potential sources of gender bias in economic evaluation of improvements in women's health and well-being. There is increasing evidence that the return on investment from women's health and education includes significant benefits to partners' health, health of children, and health of the larger society. This phenomenon can be called the "female multiplier effect", the effect that there is greater benefit to society than what is directly measured as a benefit to just women's well-being. This effect is not recognized and captured in economic evaluations.

Economic evaluations that rely on self report of gains and losses from policies that affect women's health and education will be biased in ways that may harm women, their families, and society. In addition, women may not be able to accurately assess their non-market inputs because of internalized devaluation of these contributions in society. Emphasis on market productivity means that non-market activities are overlooked completely such as child care and elder care, which are most often done by women. However, the problem is not simply omitting non-market productivity: the tendency to focus only on market-based activities results in *over*valuing of these at the same time as *under*valuing non-market contributions.

Women's non-market activities are vital to economic growth and sustainability. For example, research has found that women's and men's decisions regarding resource allocation differ, with women tending to prefer allocating resources to nutritional and health of children for example. In developing countries, income controlled by mothers improves child survival probabilities by a factor of 20 over income controlled by fathers. In developed countries where families may be more egalitarian, this difference is less extreme. However, impact on health from women's time and effort may still be underestimated even in developed countries by traditional economic surveys such as cost benefit analysis (CBA) and cost effectiveness analysis (CEA). For example, research in developed countries finds significant positive causal effects of maternal education on birth outcomes and infant mortality. In addition, women's education is correlated to improvements in partner health and longevity.

In conclusion, women most likely contribute more to child and partner health than is currently measured in economic evaluations. More research is needed to fully understand the contributions of women's health and education to the health and education capital of others.

3. Jones, A.S., Heckert, D.A., Gondolf, E., Zhang, Q., Ip, E. (2010). Complex Behavioral Patterns and Trajectories of Domestic Violence Offenders. *Violence and Victims, 15*(1), 3-17.

Introduction/Background: There is increasing value placed on evidence-based research for evaluating the criminal justice system, with increasing emphasis on the scientific rigor of experimental studies and clinical trials. This is particularly true in the literature on domestic violence, including evaluations of domestic violence offender programs called "batterer programs". For example, there has been strong emphasis on the number of re-assaults or re-arrests during follow up. However a key element of evaluation is missing: program outcome measures.

Simplistic measures such as number of re-assaults or re-arrests fail to capture the range of behavioral outcomes of batterer programs that vary in scope and intensity over time. Thus, these binary measures could produce biased and misleading estimates of program effectiveness. For example, previous evaluations have identified several trajectories of offenses: stable low level, stable high level, escalation, and de-escalation of aggression. However, these trajectories indicate a need for more systematic longitudinal research including victim interviews and details of abuse. Other studies have categorized batterers by "type" such as reactive abusers who exhibit sporadic violent behaviors. These types however have not been predictive of simple outcomes such as re-assault or re-arrest.

To measure multiple, complex indicators of violence and abuse requires larger, more comprehensive and more costly databases than are often feasible to obtain. A more innovative method is needed to capture both the complexity such as simultaneous use of different behaviors (physical assaults, emotional abuse, threatening behavior, and controlling behaviors) and the underlying dynamic processes that give rise to complex behavioral patterns over time. For these reasons, this study uses a Hidden Markov Model (HMM) which allows the researchers to identify complex patterns of violence and abuse indicators that change, possibly nonlinearly over time.

Methods: Models used in previous studies such as mixed models in a longitudinal analysis and a latent growth curve are appropriate for more continuous, predictable datasets and thus are not applicable to measure behavioral outcomes of batterers which are unpredictable and inconsistent. Instead, the researchers used a Hidden Markov Model (HMM) (MacDonald & Zucchini, 1997: Rijmen, Ip, Rapp & Shaw, 2008). DV offenders' patterns of behavioral outcomes were conceptualized as realizations of latent states. Latent state refers to an underlying, unobserved state that gives rise to the DV offender's observed pattern of behaviors. The researchers observed four main indicators of behavioral outcomes: physical violence, controlling behavior, threatening behavior, and/or verbal/emotional abuse. Assessing outcomes within these four types of behaviors, researchers measured a total of 16 possible combinations as all four behaviors could occur in any combination. The Hidden Markov Model (HMM) was used to track the offender's trajectory over time through the latent space using probabilities of remaining in a given state or transitioning to another state.

Data and measures: Sample data used in this study came from four different DV offender programs located in four geographically dispersed cities. Four indicators of abusive behaviors were derived from interview data with women who reported assaults. These indicators included: controlling behaviors,

verbal-emotional abuse, threats, and physical aggression. Women's reports were used because of significant underreporting during follow-up by male participants.

Results: Frequency distributions of the many trajectories were obtained. Out of a total of 550 observable trajectories with 76 unique patterns, 217 (39.5%) showed a stable pattern of not changing from one state to another at any point in time. Of these, 206 (37.5%) trajectories remained in the least severe state over the 15-month period while 11 (2%) remained in the most severe state for the duration. No DV offender remained in either State 2 or State 3 throughout the study period.

Discussion: The findings confirmed previous research studies of the complexity and dynamic nature of violent and abusive behaviors among batterers. Using the Hidden Markov Model and interview data enabled the researchers to identify complex behavioral patterns associated with latent states, state transition probabilities, and clusters of the trajectories between states. The behavioral outcomes from the study resembled a "constellation of abuse" that can change over time. This more accurately represents the experience of battered women and is consistent with recommendations of other researchers.

Qualitative differences among participant subgroups emerged and corroborated previous studies. For example, one cluster was persistent in their use of violence throughout the study period whereas another subgroup was stable, and less aggressive throughout, indicating minimal danger to their partners. Two other subgroups appeared to transition between a mix of more and less violent states.

The findings from these dynamic, complex models may be used to better predict outcomes. Findings may also be helpful in guiding future evidence-based interventions. However, implications for program design and implementation are still unclear because what is effective for each pattern and trajectory has not been explored yet. Additional longitudinal studies are needed to further investigate the impact of time-varying factors on batterers' behavioral trajectories.

4. Snow Jones, A, Fowler, TS, A. (2009). Faith Community-Domestic Violence Partnership. *Social Work and Christianity*, *36*(4):415-429.

Background: Previous literature suggests that women often turn to religious leaders for help with domestic problems. However, many faith leaders lack professional training in addressing domestic violence and feel unprepared to provide guidance.

Introduction: This article discusses the design and application of an evaluation of a domestic-violence (DV) community partnership and prevention program in Forsythe County, North Carolina.
The program began with a "train the trainers" preliminary development and planning committee of five clergy, which convened in September 2001. A volunteer secular DV advocate assisted with development of program materials. Two individuals of each participating congregation were trained. Feedback from participants indicated desire that the program reflect local attitudes and religious norms. Enrollment was initially low.

Goals established at the outset of the program included fostering partnerships with the secular community. Part of the strategic plan of the committee included reinforcing existing Forsyth County DV prevention and intervention programs in a way that used a streamlined approach to responding to DV. Networking with other denominations resulted in collaboration among leaders from six major churches. Secular DV service providers also participated, including law enforcement agencies and representatives from the criminal justice system such as the police chief, the county sheriff, the District Attorney and the Mayor. One barrier to recruitment that emerged was connecting with churches that had no denominational affiliation with those already involved in providing the training. A formal advisory group was created to address curriculum issues as they emerged.

Evaluation methods: Pre and post-training surveys of knowledge, attitudes, and beliefs about DV were administered via in-person forms, phone calls and focus groups with six month follow up for six trainings. These assessed improvements in knowledge attitudes and beliefs about DV. One issue that emerged was the belief that secular staff assisting with the program would not have sensitivity and understanding of religious beliefs about the role of husband and wife.

Results: In total, 49 pre and post surveys were administered. Six months follow up found changes in clergy attitudes, beliefs about and knowledge of DV and knowledge about responses associated with victim safety. At follow up, not only did training effects abate, but also participants reported frustration assisting victims. They expressed interest in a discussion forum focused on faith and DV issues. Sessions were conducted to address this need conducted by graduate student from Wake Forest University Divinity School and in coordination with the DVCC.

In addition, focus groups were organized to assess ways to sustain clergy willingness to discuss DV. The "Spiritual spa" that was used in the sessions received positive feedback. Language also emerged as an important issue: terms such as "domestic violence" and "training" were off-putting for faith leaders who preferred adding DV content to their existing ministries such as incorporating it as part of a concept of "strengthening the family" rather than new focus on DV.

Participants also cited lack of focus on batterers as a weakness of the training program. They expressed interest in supporting batterers in ways that would lead to true transformation and repentance as this

fits within the core beliefs and values of most religions. The Winston-Salem location also proved to be an advantageous location due to a high level of religious social capital.

Conclusions: This evaluation found that networking and trust building take a long time across secular and inter-faith boundaries. However, it was evident that no amount of trust will result in well-attended DV training sessions, especially when working with male clergy. It was crucial that key members knew how to market the DV training within existing faith initiatives, that they had resources such as meeting rooms and newsletters, but above all, that they could speak the institutional language.

In addition, DV advocates should know that faith leaders are desperate for guidance about the problem, even those who fear discussing it. Participants who attended expressed desire for other forums in which to discuss DV. Participants found the "Broken Vows" video to be very helpful. Finally, faith leaders should note that victims of DV experience a "crisis of faith" when appealing for help only to find that the religion may condone or fail to condemn violence they are experiencing in their family.

5. Snow Jones, A., Austin, WD, Beach, RH, Altman, D, (2008). Tobacco Farmers and Tobacco Manufacturers: Implications for Tobacco Control in Tobacco-Growing Developing Countries. *Journal of Public Health Policy*, *29*(4): 406-23.

This study examines historical evidence of conflicts and cooperation between tobacco manufacturers and tobacco farmers in the U.S.

Background: Tobacco manufacturers' efforts to obscure information about health effects of tobacco in order to increase profits have been documented in relations with the World Health Organization and in manipulation of tobacco farmers' support in other countries. For example, a fax sent from a U.S. tobacco manufacturer to the British American Tobacco board members indicated plans to exploit tobacco farmers in developing countries by funding and control of the International Tobacco Growers Association (ITGA).

Tobacco cultivation is not easily replaced by alternative income sources in many developing countries. As a result, tobacco-control strategies have to factor in this opposition to crop substitution and actively assist farmers' transition to other crops. This consideration is built into the World Health Organizations framework of tobacco control, including helping tobacco-dependent workers find sustainable alternatives. In addition, finding alternatives is a major research priority in several developing countries such as Malawi, Zimbabwe, and Zambia that rely disproportionately on raw tobacco export earnings. This study focused on tobacco manufacturers relationships to farmers in the U.S. because of the long history between the two and because declining per capita tobacco consumption in the latter half of the 20th century may be followed by declines worldwide.

Methods: The data for this analysis comes from tobacco documents made publicly available by the attorneys of the 1998 General Master Tobacco Settlement Agreement (MSA). This study aimed to gain greater understanding of the relationship between the tobacco control movement and manufacturers, particularly from the manufacturers' perspective, and to examine ways in which this information might inform and aid tobacco control strategies, especially those used in developing countries that are economically dependent on tobacco. Of particular interest were documents that discussed the U.S. tobacco manufacturers' relationship such as documents revealing manufactures and farmers' conflicts and how it affected the relationship over time. Most documents were from Philip Morris (PM) and RJ Reynolds (RJR) consistent with these companies' large and growing market share during the timeframe and thus policy influence.

Out of 9,746 documents that contained the word "grower", text searches were conducted using terms such as "interests", "strategy", "relation", "alliance", "political action", and "opposition" as well as names of tobacco manufacturer staff or executives involved in interactions with growers or who had commented on or analyzed relationships with growers. Only a few documents (18) described U.S. tobacco manufacturer-farmer conflicts. Based on the context of these documents, this study concluded that these conflicts are long-standing and inherent in the buyer-seller or principal-agent nature of this relationship. Because the conflict was a "given", this may account for the dearth of documents pertaining specifically to this relationship.
Importantly, the most useful documents were "historical analysis" documents, which included retrospective analyses of tobacco manufacturers-farmers conflicts and their causes to suggest possible strategies. The conflict documented in these materials, while "historical", appears to be on-going and market-driven. No evidence suggests that conflicts over competing market objectives would be unique to developed countries.

Results: One document was particularly informative, an RJR internal memo written in 1977 by the Director of Corporate Public Affairs titled "Tobacco Grower Relations". It provided a historical overview of U.S. tobacco farmers' relations from RJR's perspective, discussing sources of friction between the two parties: 1) the market price of tobacco, 2) changes in cigarette production technology that reduced demand for tobacco, and 3) increases in imported tobacco. The memo also documented historical and continuing conflict from the buyer-seller relationship; the dominant source of tobacco manufacturer-farmer friction, although both parties benefited from sales. The memo emphasized the need for "complete industry unity" in response to the new "health scare" as several studies during that time period had identified a link between smoking and lung cancer.

Other documents such as a Philip Morris Briefing Book from 1985 provided evidence that other manufacturers were aware of long-standing conflict and were considering new political strategies such as building new coalitions and alliances if the grower-manufacturer alliance deteriorated. PM also had substantial commitment in developing countries, which was viewed as an investment in the future. This was because of signs at the time that the domestic price support system for locally grown tobacco (called the quota system) was moving toward extinction. Fortunately for the U.S. farmers, the quota system remained intact, allowing stable world-market tobacco prices and allowing tobacco to continue to be a lucrative crop for many U.S. tobacco farmers, at least until quota cuts in the late 1990s began to erode profits and quota asset value.

Discussion: The manufacturer-grower alliances stayed strong because each partner in this relationship relies on high demand for tobacco products to stay profitable and tobacco continued to be profitable with few viable alternatives. In addition, many farmers were older than 50 years, and may have been more interested in a reliable crop to preserve retirement prospects than to switch to non-tobacco alternatives. Finally, tobacco farming in the U.S. is a multi-generational lifestyle for many farmers.

Of note however, U.S. farmers had far more political clout with national and local lawmakers than farmers in developing countries. In addition, U.S. farmers have more business opportunities and employment options to develop non-tobacco alternatives than farmers in the developing countries. The sharp decline in US tobacco farmers suggests many made this change. Finally, the price support system stabilized the market to the advantage of U.S. growers. Farmers in developing countries were subject to price variation and were more likely to have a greater economic incentive to try other products.

Clearly, manufacturers will continue to try to expand sales and consumptions in all its forms wherever they can find or create markets. Manufacturers may compete for market share and disagree on regulation if they receive different benefits from it but they will certainly band together to fight broad economy-wide tobacco control measures such as tax increases and smoking or advertising bans. Manufacturers' opposition to tobacco control will be cohesive and powerful. Tobacco control advocates working with farmers must also be sustained, cohesive, and strategic.

6. Jones, A.S. & Frick, K. (2008). Commentary. Gender bias in economic evaluation methods: time costs and productivity loss. *Women's Health Issues 18*, 1-3.

Cost-effectiveness analysis (CEA), or cost-benefit analysis (CBA), are increasingly common evaluation methods in public health research. However, methods may unintentionally incorporate historical and cultural gender bias. This results in lower estimates of productivity gains and other benefits from intervention and programs that improve women's health. There are three main sources of potential bias in economic evaluations:

1) Process of estimating productivity losses and time losses due to illness and treatment
2) Quality of life estimates, generally but also as applied to types of conditions that are more likely to affect women
3) Economic measures that overlook secondary affects that are not calculated as part of economic events. For example, gender role differences interact with health and well-being of family members to produce secondary effects that may be large in magnitude but are not factored into economic analyses.

In 1996, there was a United States panel on cost effectiveness in health and medicine which established a "gold standard" methodology for calculating CEA (cost effectiveness analysis). This standard method included a formula for measuring time lost from productive labor due to illness or treatment. The usual method to calculate this value is by multiplying the amount of time in hours lost from productive activity by the hourly wage rate.

For CEA, the panel recommended using wage rates associated with gender and age to obtain the most accurate estimate. However, this will result in a more favorable cost-effectiveness ratio for women than for men due to differences in wage rates between men and women which have cultural and historical causes. For example, a new treatment may be more effective but also more costly than prior treatment options. If all other factors are equal except for differences in wages of men and women, the same amount of treatment time but multiplied by a lower hourly rate (for women) finds the treatment is more cost-effective for women than for men.

A second common economic evaluation method, cost-benefit analysis (CBA) results in a lower value for time lost from productive work for women than for men. CBA will consistently underestimate gains in net benefits from fewer hours lost productivity relative to the same reduction for men. If there were no gender based differences in lost time, the cultural undervaluation of women's productivity as reflected in wage rates will result in an undervaluation of improvements to women's lost productive time and the value of women's treatment time. This means that for policies that take factors such as gender into account (such as those in which decision makers must choose between health interventions for diseases that affect only one gender or the other), the former effect will tend to lead to overly favorable adoption of interventions that decrease male productive losses whereas the latter will tend to lead to overly favorable adoption of treatment time intensive interventions that benefit women. For example, if a domestic violence program significantly reduces a woman's time lost from work and home management, the calculation of the real gain in productivity resulting from the program will be

undervalued by 10-20%. This is because of the gender wage gap which results in lower program benefits and making it less likely to be adopted than a program that reduces men's lost time from work. Thus, when a CBA or CEA is *not* gender-specific, these biases may have unpredictable effects on policy recommendations.

More research is needed to identify potential sources of gender and race/ethnicity bias in existing economic evaluation methods and to refine these methods to better account for potential sources of biases. In addition, new research is needed to more fully assess the impact of gender roles on estimates of women's productivity losses.

7. Maternal Alcohol Abuse/Dependence, Children's Behavioral Problems and Home Environment: Estimates from the NLSY Using Propensity Score Matching. *Journal of Studies on Alcohol and Drugs 68*(2):266-75.

Introduction: In this study, the authors assessed the relationship between maternal alcohol abuse (AA), Alcohol dependence (AD), child behavior problems and child home environment in a sample of young women and their children using data from the 1994 National Longitudinal Survey of Youth (NLSY). Propensity scores were used to form matched comparison groups based on maternal characteristics. The main objectives of this undertaking were to employ propensity score (PS) matching to determine whether child behavior problems and home-environment deficiencies associated with maternal AA/AD are a possible causal result of alcohol and to quantify these effects.

The authors focused only on mothers' alcoholism, in part because there was no data available on paternal alcohol abuse from the 1994 NLSY. In addition, they note that more women work in the home or part time in order to devote time to child care and even among women who work full time, they spend more hours on average on childcare than their male spouses. Therefore, maternal AA/AD even though less prevalent than paternal AA/AD may have a greater impact on child outcomes.

Previous research has established a relationship between parental alcohol consumption and children's behavioral problems, but this relationship is highly complex. Alcoholism may negatively affect parents' understanding of children's behaviors as well as negatively affecting parents' behaviors which in turn influence children's development. In addition, alcoholic parents may have a different tolerance for children's behavior problems than a nonalcoholic parent, which results in biased estimates of the effect of parental drinking on children's behavior.

Methods: Because it's impossible to randomize individuals to alcoholism or to alcoholic parents, the authors created comparison groups of children of alcoholic mothers matched on observed covariates with children of non-alcoholic mothers to estimate the causal effects in observational studies. The authors used data from the 1994 cohort of the National Longitudinal Survey of Youth (NLSY79) and the 1994 Children of the NLSY (CoNLSY94). Drinking was classified as individuals who reported drinking within the 30 days before the interview. In 1994, the NLSY included 29 symptoms used in the DSM-IV definitions of AA or AD to classify female drinkers as either AA or AD and were reliable definitions in previous similar studies. Regression analysis was conducted using the following descriptive variables: Individual characteristics (age, race, education level, marital status), family of origin characteristics (family socioeconomic status), alcohol in family of origin, early drinking behavior, drug use, individual mental health indicators and alcohol availability and attitudes in place of residence.

Propensity scores were estimated by predicting the probability of AA/AD, given the observed covariates. The authors conducted regression analyses of binary indicators and then sub-classified each observation into quintiles based on the propensity scores.

Results: Results from the regression analysis showed that marital status was significantly associated with AA or AD. Mothers who were never married or separated were significantly more likely to be classified as exhibiting AA or AD than married women. Mothers in this group had about a two-fold

increase in alcohol propensity. Mental illness and drug use were strongly associated with mother's alcohol status. Smoking was also associated with an increase in the odds of AA/AD.

Propensity score results: The authors compared PS scores across the quintiles. The main findings of note were that for both male and female children, those with non-alcoholic mothers had lower behavioral problem scores after controlling for relevant observed covariates.

Discussion: Overall, children with non-AA/AD mothers had lower behavior problems regardless of the child's gender. However, sons of mothers with AA/AD had elevated behavior problems while daughters of alcoholic mothers experienced less supportive home environments. While behavioral problems among boys may be a reflection of higher prevalence of antisocial behavior in boys in general when compared to girls, the gender differences in home environment scores is harder to explain. More research is needed to understand the relationship between children's emotional support and parental alcoholism.

8. Jones, A.S., Austin, D., Beach, R.H., Altman, D. G. (2007). Funding of North Carolina Tobacco Control Programs through the Master Settlement Agreement. *American Journal of Public Health, 97*(1):36-44

Background: Master Settlement Agreement (MSA) funding for tobacco control programs has fallen short of public health advocates expectations. This is partly due to the structure of MSA funds, but also due to shifting political goals and fiscal priorities in many states. The authors analyzed these factors in North Carolina, a tobacco-dependent state with above-average tobacco use, both factors which make NC an excellent case study to discuss implications for future tobacco control efforts.

State lawmakers face challenges of competing interests of tobacco lobbyists, economic pressures facing tobacco dependent communities, economic development needs due to loss of manufacturing jobs. Other factors have contributed to a constrained economic climate such as shrinking tax revenues and rapidly rising Medicaid costs. Part of the structure of the MSA funds is the phase 2 payments which are set up to compensate tobacco growers for revenue losses resulting in decreased demand because the MSA also required manufacturers to raise prices.

While the MSA included plans to spend significant portions of funds on smoking cessation programs, several studies have shown that only a small proportion of MSA funds have been dedicated to tobacco control.

In North Carolina, the MSA funds are essentially divided into three major foundations which have different priority areas in which they disperse funds. The Golden Leaf Foundation receives 50% of the MSA funds for the state, and its main objective is improving economic and social conditions in North Carolina. The Tobacco Trust Fund receives 25% of MSA funds and is responsible for assisting tobacco farmers, tobacco quota holders, tobacco-related business owners, and individuals displaced from tobacco related employment. It is also responsible for fostering a strong agricultural economy in the state. The third foundation is the Health and Wellness Trust Fund which received the remaining 25% of MSA funds. It is charged with addressing the health needs of vulnerable and underserved populations, supporting health research, education, prevention and treatment programs, increasing capacity of communities to respond to public health needs, and developing a comprehensive community-based plan with goals and objectives to improve the health and wellness of North Carolina residents, with an emphasis on reducing youth tobacco use.

Methods: The authors analyzed grant award data from the websites of all three foundations and from the phase 2 website, assessing how funds were distributed within each foundation's priority areas. MSA funds without phase 2 payments included 22.3% on agriculture, 32.6% on economic development and 45% on health related projects, but the majority of this went to medication assistance and a prescription drug initiative that fulfilled the governor's campaign promises. MSA funds including phase 2 payments resulted in 60% to agriculture, 7.8% to economic development, 10.8% to health related programs and 21.1% to the general fund, which was diverted to eligible tobacco growers and quota owners to use in any way with no restrictions including crop diversifying, growing more tobacco, paying off farm debt, or funding retirement. This funding was predicted to exceed growers' losses caused by the MSA but in fact it did not.

Results: The authors found that North Carolina's allocations of MSA have fallen short of tobacco control advocates expectations and instead, funds were used to support tobacco farmers transition away from tobacco. For example, health-related projects received 45% of funding but tobacco control received only 9.6%.

Despite these figures, there were positive signs as well. Beginning in 2003, evidence emerged that spending on smoking prevention increased despite North Carolina being a state that was previously hostile to cessation efforts. In addition, within one year from 2003 to 2004 North Carolina went from being ranked 30th from the top on tobacco prevention spending to 21st due to its spending on the Teen Tobacco Use Prevention and Cessation program.

There is significant evidence of the efficacy of tobacco control interventions and the CDC has recommended that North Carolina spend a minimum of $42.6 million annually on these programs. In addition to focusing on teen use prevention, North Carolina must address negative health and cost issues among adult smokers or nonsmokers exposed to environmental tobacco smoke.

The authors analyzed reasons why money that was predicted to go into tobacco control but ultimately went into economic development and support for tobacco farmers. One major reason was the state's effort to balance its budget as well as fulfilling campaign promises such as prescription drug program for seniors. In addition, decreased tax revenue, anti-tax sentiment, and health care costs drowned out the voices of tobacco control advocates. While tobacco control advocates have had policy successes on the national level, state level efforts are hindered by more homogenous political constituencies which are more powerful than legislators' views. Research has also found that party affiliation is an important predictor with Democratic governors outspending Republicans on tobacco-control programs.

Conclusion: In conclusion, between 2000 and 2004, the authors found that tobacco farmers experienced significant financial gains from the phase 2 payments and quota buyout payments. However, the authors noted that these short term gains will not be enough to sustain tobacco growers in the long run as farmers face significant barriers in diversifying.

Public health advocates must continue to provide political support to farmers and farm communities until these populations receive necessary assistance for the transition away from tobacco production. By doing this, tobacco control advocates can advance community health as well as foster partnerships with workers and communities that can eventually fuel constituents demands to legislators for comprehensive tobacco control programs.

9. Snow Jones, A., Dienemann, J., Schollenberger, J.,Kub, J., O'Campo, P., Gielen, A.C., & Campbell, J.C. (2006). Long Term Costs of Intimate Partner Violence in a Sample of Female HMO Enrollees. *Women's Health Issues 16*, 252-261.

Background: The National Center for Injury Prevention and Control at the CDC estimates that the cost of intimate partner violence (IPV) is about $5.8 billion annually. Most of these costs are related to health care associated with abuse, such as increased gynecologic care, neurologic care, and stress-related health problems. A wide range of health problems are associated with domestic violence including injuries (face, neck, abdomen), recurring pain from damage to the central nervous system, illness associated with chronic fear and stress such as gastrointestinal disorders, viral infections such as cold and flu, cardiac problems such as hypertension, and gynecological problems associated with sexual abuse.

Previous studies have found approximately two-fold increase in costs and use of services among female HMO enrollees with medical record indicators of IPV. These studies found that the cost of health services used by battered women averaged about $1,633 per patient per year among currently abused women. Most increased costs were associated with higher rates of hospitalization, higher general clinic use, use of mental health services, and out-of-plan referrals, all costs occurring at the same time. However, no previous studies looked at costs associated with IPV that specifically involve sexual assault. Only two prior studies examined costs over more than one year.

A previous study in 1999 by several authors in this group assessed prevalence rates of IPV in a Washington D.C. HMO. The authors concluded that higher socioeconomic status did not preclude women from being at risk of IPV. This study is a follow-up to the 1999 findings, using the same data, but looking at the health costs of intimate partner violence.

Aim: The following study aimed to assess whether or not IPV victims in this relatively well-educated and well-insured sample had higher health costs than women with no history of IPV and whether or not this difference persists over time.

Methods: Letters were mailed to 21,426 women between the ages of 21-55, asking them to participate in a health survey, without mentioning abuse for safety reasons. The final sample after excluding ineligibles totaled 2,005. Participants were screened on ever experienced physical or sexual abuse. A sample of 240 participants among those never abused was randomly selected (n=240). This sample of women who reported never having experienced abuse was given the same in-depth interview. Health costs associated with each participant were obtained from the HMO.

Statistical analysis revealed that the two groups differed significantly on a variety of demographic characteristics such as race, income, and education which also may influence health outcomes and costs. Propensity score matching was employed to reduce bias, with each woman assigned a propensity score and the scores compared for abused versus not-abused women.

Results: Over the three-year period, the average health cost of abused women consistently exceeded those of never abused women. Over the three-year study period, the difference was almost $1,700 but

was not statistically significant. However, it is still an important difference for insurers if subsequent research with larger samples confirms it.

Discussion/Conclusion: The differences in costs found in this sample of mostly middle class, working women indicates that higher social class and financial well-being do not result in lower health costs associated with domestic violence than those reported by lower income women. This study did not include data on participants' childhood histories of abuse which could be a potential confounding factor. In addition, the study did not obtain participants lifetime trauma history.

Use of propensity scores improved estimates, but did not remove bias from differences in unobserved characteristics that influence the outcome of interest. However, a consistent pattern emerged of higher costs for abused women.

The difference of $1,700 total costs seems small but has significant implications. For example, if an insurer had 300,000 female enrollees, they could assume that 38% of them have been abused at some point in their life. This would translate into almost $2 million dollars in additional claims over a three-year period.

Consistent with previous studies, women who report no history of abuse tend to have lower health care costs in almost every comparison. Increased costs among women reporting IPV are associated with gynecological and central nervous system problems, and /or stress conditions, injuries, and mental health. Physician awareness of the importance of IPV screening and the immediate health problems associated with it is increasing. However, this awareness must expand to health problems that persist or develop over time as a result of the abuse. Failure to do so has implications for treatment and cost implications for insurers and the women themselves if the root cause is not identified.

10. Snow Jones, A., & Richmond, D.W. (2006). Causal effects of alcoholism on earnings: estimates from the NLSY. *Health Economics*, *15*(8), 849-71.

Introduction: It has been estimated that productivity losses make up 40 percent of costs associated with alcoholism. More recently, it has been posited that the most "compelling agenda item" in economic research on alcohol is the relationship between alcohol, earnings, and productivity. This paper investigates the relationship between alcohol consumption and earnings in male and female samples drawn from the National Longitudinal Survey of Youth (NLSY).

Background: Much of the literature on the effects of alcohol consumption and abuse on economic productivity has focused on males, probably because of their relatively high incidence of alcoholism and alcohol abuse and their higher labor force participation rates. While some results show that alcohol abuse reduces the probability of working, in younger males, results show no negative impact on earnings. New evidence suggests that in younger cohorts, alcohol use and abuse is associated with higher earnings. Such findings could be due to life-cycle variations in employment patterns between alcohol abusers and their non-abusing counterparts. For example, younger alcohol abusers who drop out of school or don't pursue post-secondary education could translate into higher wages earlier in life. In older males, higher earnings could be due to the need to keep working because of failure to accumulate sufficient retirement capital.

Studies of the impact of women's alcohol use and abuse on labor force outcomes provide sparse and sometimes contradictory evidence. For example, a study that examined hourly wages in females who worked 20 hours or more per week found weak evidence that moderate consumption of alcohol in women working 20 hours or more was associated with higher wages, but women who were light or heavy drinkers had wages that were equal to those who abstained. In addition, a study using NLSY data found that earnings were higher for women who were heavy drinkers. However, when instrumental variables (IV) methods were used, alcohol consumption appeared to increase female hours of work significantly, and, in some cases, earnings. This contrasts with young men for whom the impact of alcohol consumption was negative and became more so when IV methods were used. A more recent study found that there is no evidence for a causal relationship between alcohol consumption and labor force outcomes.

Determining causal effects using propensity scores: Previous studies comparing labor force outcomes of alcoholics and non-alcoholics have used switching regression, Heckman selection models, or IV methods to account for possible selection effects. Results have been contradictory, especially for female labor force outcomes. There is some evidence that use of "matching" cases with comparison observations using observed covariates produces better estimates of causal effects in quasi-experimental samples. Such matching can be achieved using propensity scores (PS).

Data: The data used in this study is from 1989 and 1994 of the NLSY, a data set that is unusually rich in information on labor force participation, earnings, household characteristics, health and mental health, smoking, and drug and alcohol consumption. It is a nationally representative sample of 12,686 youths who were aged 14-21 in 1979. Of these, 6,283 are women. In 1989, the cohort age range is from 24-31

and in 1994 the age range is 29-37 years. Of the original sample enrolled, 90% were still enrolled during these years.

Classification of drinking: In both 1989 and 1994, questions asked about problems related to drinking. In 1989, the information corresponds to items used in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders III (DSM-III-R) and in 1994 it corresponds to the DSM-IV. Because there is some evidence that clinical instruments such as the DSM-III-R and DSM-IV may be inadequate for identifying alcoholics and problem drinkers, especially among women, in population-based surveys, binge drinking behavior was examined to determine whether or not men and women classified as alcoholic exhibited other behaviors associated with heavy or problem drinking.

Variable definitions and means: Variables used in estimating propensity scores included demographic variables, family of origin variables, human capital variables, antisocial behavior measurable, and geographic variables.

Methods: This study uses propensity scores (PS) to create matched comparison groups to avoid evaluation bias that can occur in quasi-experiments where it is not possible to randomize individuals to different alcohol consumption groups. The advantage of comparing groups based on their propensity to abuse alcohol is so that differences in response that vary with propensity can be investigated. This study aims to determine whether or not productivity losses attributed to alcoholism and alcohol abuse are the causal result of alcohol and to attempt to quantify these causal effects. Results from this method will then be compared with results from instrumental variables (IV) methods.

Logistic regressions were used to estimate a PS for each gender and year: The probability of being classified as an alcohol abuser or dependent. The goodness of fit of the logistic model indicated that for all regressions, the fitted model was statistically significantly better than the null. A PS was predicted for each observation. Then the distribution of PS was compared for alcoholics versus non-alcoholics within each year and gender. Non-comparable observations were removed in order to improve the match between individuals in the two drinking groups. Once the non-comparable scores were removed, quintiles were formed based on the rank ordering of observations from lowest to highest PS.

Results: Regression analysis was used to analyze results for male and female by each of the two years. Estimates for age and race variables support previous research showing a higher probability of alcoholism for younger individuals and for White participants. Results for men consistently indicate a reduction in alcohol abuse for each year of age. African-American males were significantly less likely to be alcoholic than White males in 1989. A similar pattern is observed for African-American women although statistical significance at conventional levels is achieved only in 1994 when the difference becomes more pronounced. This may be due to the small number of alcoholic African-American females in the sample.

Men and women who report they have never been married or were divorced or separated were significantly more likely to be classified as alcohol abusers than married men or women in both years. As previous studies have found, association between number of children and likelihood of being alcoholic is most pronounced for women. Availability of alcohol, having biological relatives who are

alcoholic and use of alcohol at a young age generally increases the likelihood of being alcoholic. The strongest effects were from the individual's own history of alcohol use: for men, both age at first drink and abstinence of alcohol were statistically significant. For each year delayed before first drink, men were less likely to become alcoholic. Co-occurring disorders were positively associated with alcoholism, with marijuana and cocaine use having the largest effect of increasing the odds of alcoholism.

There is little difference for women in mean wages observed between the highest and lowest quintiles; however, the overall negative impact on earnings does appear to increase over time. For men, the difference in earnings between the lowest and highest quintiles appears to increase over time as does the overall negative impact of alcoholism on earnings.

Analysis of annual wages found that in the quintiles where propensity to be alcoholic is low, alcoholics appear to earn roughly $1500 more that their non-alcoholic counterparts. In contrast, non-alcoholic men in the quintile with highest propensity to be alcoholic earn over $2000 more per year than their alcoholic counterparts. By 1994, wage differences appear to favor non-alcoholics strongly and fairly consistently where propensity to be alcoholic is lowest. While wage rates appear to decline with increasing propensity to be alcoholic, non-alcoholic men consistently earn at least $2200 more than their alcoholic counterparts in these quintiles. The small number of alcoholics in these quintiles reduces the power to detect a statistically significant difference but the magnitude of the earnings difference is practically important as a percentage of annual earnings.

One problem with annual earnings estimated above is that individuals with higher annual earnings may achieve this by working more hours. In order to determine whether or not variations in annual earnings were attributable to variation in annual hours worked, a similar analysis based on PS was performed with calculated hourly earnings rate as the dependent variable. The same general pattern of decreasing hourly earnings with increasing alcoholism propensity as was seen with annual earnings is observed, but it is less pronounced once hours worked is taken into account. An extremely consistent pattern in estimated hourly earnings rates emerged in the 1994 data, with non-alcoholic women clearly favored. In all groups except quintile 1, alcoholic women worked more hours than their non-alcoholic counterparts suggesting that higher wage rates account for most of the earnings differences that were observed between alcoholic and non-alcoholic women.

Discussion: These findings suggest that as individuals change, the employment effects of alcoholism change at least over the early life cycle. Patterns based on the 1989 classification and 1990 labor force outcomes suggest that alcohol wage effects were mixed and overall negligible. These results also suggest that the differences in hourly wage rates and hours worked account for observed differences in annual earnings. While the differences in men's hourly wage rates are not large, by 1994 they consistently favor non-alcoholic men in all but one quintile and are reflected in the overall adjusted effect on annual earnings. Among women, the wage premium for non-alcoholics is striking by 1994. Non-alcoholic women appear to be receiving substantially higher hourly earnings than their alcoholic counterparts. Furthermore, they work fewer hours. If supported by subsequent research, this suggests that women may be particularly vulnerable to the negative effects of alcoholism on wage rates.

Conclusion: The findings from this study are consistent with other studies that have found alcoholism to have a negative impact on earnings. By using matching PS and a rich data set instead of instrumental variables (IV) analysis, this study avoided some of the problems frequently associated with IV estimators. The results provide strong evidence that life cycle effects of alcoholism may vary and possibly increase over time. In this sample, the annual and hourly earnings difference becomes more pronounced, especially among women from 1989 to 1994.

Productivity losses from alcoholism may increase throughout the life span and may have different levels of impact depending on gender and individual characteristics related to the propensity to be alcoholic. In light of these cumulative effects and the addictive nature of alcohol which makes productivity losses less a matter of informed individual choice, economic and regulatory policies directed at reducing alcoholism among teen and youthful drinkers seem fully justified. Future research should seek to understand the trajectory of these outcomes over the life cycle among both active alcoholics and alcoholics in recovery as well as the groups excluded from this study: lifetime abstainers and those who did not drink in the 30 days prior to interview.

11. Snow Jones, A, Fowler, TS, Farmer, D, Anderson, RT, Richmond, D, (2005) Description and Evaluation of a Faith Community-Based Domestic Violence Pilot Program in Forsyth County, NC, *Journal of Religion and Abuse*, *7*(4):55-87.

Background: A variety of initiatives aimed at reducing the incidence of DV have been implemented in the United States such as improvements to law enforcement and criminal justice responses to DV, which include mandatory batterer program participation, increased health care provider awareness and screening and increased shelters for victims of DV. Despite these efforts, DV remains the main cause of homicide for women and continues to represent a significant public health burden on society.

The complex sensitive nature of DV presents a barrier to developing community-based DV prevention programs. Previous research suggests that cultural beliefs about family privacy and religious beliefs about sanctity of the family prevent victims from seeking help and faith leaders from intervening. These beliefs are reinforced when sacred writings are misinterpreted or taken out of context so that some batterers have been reported to believe that DV is Biblically acceptable or tolerated in their faith communities. Improving DV prevention requires collaboration of community leaders and faith leaders be prepared to confront historical and religious aspects of DV as they become better equipped and competent in assisting victims.

Domestic violence in North Carolina and Forsyth County: North Carolina has one of the highest rates of intimate partner homicide in the U.S. In 2002, the Violence Policy Center ranked it 9th in the US for number of females murdered by males in single victim/single offender homicides, with 597 murders during the seven years studied.

Data from court cases in 2001 indicated that roughly one-third of all DV arrests in Winston-Salem and Forsyth County involve spouses, while another one-third involve a current girl or boyfriend. The remaining one-third are ex-girl and boyfriends. Roughly half of all cases involved African-Americans, about 40% Whites, and 6% Latinos. Women were the victims in 80% of the cases. Most of the perpetrators had at least one prior DV charge with an average of eight prior charges and five prior convictions.

DV Services in Forsyth County: Forsyth County has been on the cutting edge of DV intervention and prevention since 1978 when the first emergency shelter for battered women in North Carolina opened there. Family Services advocates have worked closely with the DA's office and local law enforcement agencies over the last two decades to create an integrated and comprehensive system for DV response. IT is the lead agency addressing DV/sexual assault, offering a range of services from temporary housing, survivor support groups, collaborative community efforts that address DV, sexual assault, and child abuse.

One of the primary collaborative community efforts coordinate by Family Services is the Domestic Violence Community Council (DVCC). Founded in 1999, the DVCC was formed through a multi-system request to coordinate the efforts of public, private, and non-profit organizations providing services to DV victims and offenders in Forsyth County.

Religious and Social Capital in Forsyth County: Winston-Salem and Forsyth County represent unique opportunities to develop community-based DV prevention programs as these counties have been found to have high levels of church attendance and affiliation. 71% of respondents in a survey said they belonged to a church, synagogue or mosque compared to the national average of 58%. However, if

faith leaders knowledge about identifying and addressing DV and community resources are faulty or non-existent, this may hinder victims' help-seeking and faith or lay leaders' responses.

Church-based Health Promotion and Disease Prevention Initiatives: The DVCC's Faith Leader Training Program (FLTP) is based on well-established research that describes and evaluates church-based health education initiatives to prevent or intervene with a variety of health related issues. The networks of social support in faith communities are particularly advantageous for communication and access to population subgroups. The use of faith community channels for health-interventions have been successfully used for health interventions such as training clergy or lay leaders to provide education and information on HIV, mammography screening, smoking cessation, cancer, weight loss, and cardio-vascular disease.

Faith Leader Training Program Format: The format for the training sessions begins with an overview of DV by a domestic violence counselor from Family Services. A video from the Faith Trust Institute, *Broken Vows,* is shown and is used as a jumping off point for discussion among the group about faith issues and DV. This discussion can include readings from sacred texts or talks by DV survivors as well. Next, trained faith leaders describe barriers that are often encountered when faith leaders try to address DV or are confronted by it. For example, these may include misinterpretations of sacred writings and key concepts such as repentance, accountability and behavior change, minimization of the danger to the victim due to teachings about forgiveness, and fear that secular providers will promote divorce or be insensitive to religious beliefs. Next, the DV counselor presents appropriate responses to victims and batterers, resources and strategies for helping victims to safety. A handout packet is also provided containing DV and faith-related materials for disseminating in the community including hotline stickers and brochures for women's restrooms. Participants meet for follow-up sessions with discussion, problem-solving, and success-sharing facilitated by a Master's of Divinity candidate from Wake Forest University Divinity School and a DV counselor from Family Services. Finally, participants agree to a *"Covenant of Performance"* which emphasizes victim safety and represents an agreement by program participants to always work with Family Services and the FLTP in developing DV initiatives within faith communities.

Program Participation: The success of this program requires support from leaders at high levels of hierarchical faith organizations. It is challenging to gain support and trust of many faith leaders as some may believe that DV does not occur in their communities. This program had a year between the first training in September 2002 and the third training in late summer 2003 to build connections to regional denomination leaders. This approach leaves out non-denominational churches that lack hierarchy, which introduces selection bias in the sample and the program. However, it is important to start somewhere and going with churches easily recruited will hopefully lead to increased visibility and credibility so that smaller congregations and harder to reach denominations and faith communities will become open to DV training.

Evaluation methods: Researchers at Wake Forest University School of Medicine created an pre-and-post survey tool to assess faith leader knowledge, attitudes, beliefs and behaviors about DV, evaluate the program in terms of successful communication of the importance of victim safety, and to improve faith leaders' self-efficacy and willingness to communicate about DV. Data was collected prior to training, immediately after training, and at six-month follow-up. 49 participants completed the survey, with about half clergy and half lay leaders because each participating congregations was required to send one of each to the training.

Results: One of the most important indicators of improvement in knowledge associated with victim safety was a survey item that asked participants to rate their agreement with a statement that clergy should provide couples counseling to an abused woman and her husband. Most DV experts agree that couples counseling is inappropriate when abuse is present as this may endanger the victim. Before the training, most participants supported couples counseling but after the program, most disagreed that this was appropriate with a significant p value. Other survey items reflected significant changes in knowledge with respondents less likely to agree that clergy should speak to the abuser about his behavior and more likely to agree that the victim should seek DV services.

At six month follow up however, changes in attitudes toward victims are diminished, but still improved from prior to the training. Efficacy and communication improvements seemed to have been lost by six months. While the participants did seem to increase the frequency with which they asked about abuse after the training, by six month follow up, they also dramatically increased agreement with the statement that talking to women about abuse is frustrating. It appears that when clergy attempt to communicate with women about DV, they encounter barriers that without additional help and support, erode gains in self-efficacy.

Conclusions: Although preliminary, this pilot program provides strong evidence that a community-based DV training program offers great potential to improve faith leaders' knowledge about and response to DV, to improve victim safety, and to create supportive environments where DV is discussed and responded to appropriately. Even though the sample was small, there were statistically significant changes in items directly related to victim safety.

Focus groups were also held after the evaluation to learn more about problems that participants encountered when attempting to address DV. Findings from these groups are intended to improve the training program. Finally, evaluation of a larger program is needed to confirm the findings of these preliminary findings. If confirmed by a larger study, it would suggest that faith communities offer a powerful way to reach the broader community about DV prior to legal incidents. If this mechanism could then be linked to measurable declines in reported DV incidents, it would provide strong evidence that faith communities should be targeted for future DV prevention initiatives.

12. Snow Jones, A, R.B., D'Agostino, E.W. Gondolf, and A. Heckert. (2004). Assessing the Effect of Batterer Program Completion on Reassault Using Propensity Scores. *Journal of Interpersonal Violence 19,*1002-20.

This study used the lessons learned in previous study (Instrumental variables analysis) and was ultimately successful and useful. The article is based on the same data as the instrumental variables analysis but applied a different technique, called propensity score analysis, to examine whether program completion has an effect on the probability that the batterer will reassault his partner. This method is based on some evidence that the predictive ability of quasi-experimental studies can be improved by using matching or stratification, which is achieved by assigning propensity scores.

Data was taken from the same four-site study as the data in the previous study, but used only a subset of participants from three of the sites. Voluntary participants (not court-ordered and monitored) were analyzed as these are representative of attendance at batterer programs in general which is not heavily enforced. Scores that describe the propensity to complete a batterer program were estimated using a logistic regression. Cases were assigned scores and then subclassified. The main finding was that comparison of the cases on probability of reassualt suggests that program completion has its largest effect among men who are ordered to a program by the courts (as opposed to men who voluntarily enroll). Program completers (among the court ordered group) had a fairly large reduction in probability of reassault relative to program dropouts. In contrast, voluntary participants had negligible difference between completers and dropouts. The higher reduction in reassault among court-ordered batterers who complete a program is likely due to the coercive reinforcement of the courts and less a result of severe psychopathology. These findings of program effect suggest that program completion reduces the probability of reassault by an amount that is of practical importance.

13. Wage and Non-Wage Compensation Among Young Alcoholic and Heavy Drinking Women: A Preliminary Analysis. (2002) *Journal of Family and Economic Issues, 23*(1),3-25.

Background: Several gender-based differences in alcohol-related behaviors have been well-established: in general, women consume less alcohol than men, they are less likely to have drinking related problems, and they are more likely to abstain altogether. However, when they do consume alcohol, women appear to be more susceptible to negative biological consequences such as higher blood alcohol concentrations than men who consume the same amount of ethanol. Women who drink heavily have higher mortality rates and rates of cirrhosis than men. Research has found other correlates of alcoholism in women such as low self-esteem, depression, neurosis, absence of a family or occupational role, higher income, positive family history of alcoholism, history of child abuse, delinquency, impulse control, leaving school early, being white, being employed, and being younger (21-34 years of age).

Much of the research on the impact of alcohol consumption on labor force characteristics has focused on males. Higher incidence of alcoholism among males combined with their higher workforce participation rates probably accounts for some of this bias in the research. While women have lower incidence of alcoholism, research has repeatedly found an association between paid employment and elevated alcohol consumption among women. However there is little evidence to support the theory that this association is stress related.

So far, the economics literature on has yielded conflicting theories about the relationship between women's alcohol use/abuse on labor force outcomes. One study used 1979-90 panels of the National Longitudinal Survey on Youth (NLSY) to understand relationship between women's drinking and wages using more sophisticated econometric methods. Using fixed effects models, the researchers found that young women's earnings were higher for women who were heavy drinkers. To control for simultaneity, the authors used instrumental variables (IV) analysis and found that alcohol consumption increased women's hours of work and in some cases, their earnings. This contrasts findings for men which show that the impact of alcohol was negative and became more so when IV methods were applied. Omission of children and marital status may account for the finding of higher number hours of work in women.

These studies have largely focused on earnings, productivity, and education. A recent study assess the association between alcohol consumption and selected job characteristics such as fringe benefits and type of occupation in males. The authors note that estimates of productivity losses due to alcohol consumption that are based on wage differences only may be unreliable if alcoholics also differ from non-alcoholics on non-wage job attributes. Using data from 1989 NLSY and classifying men as alcohol dependent based on DSM-III-R criteria or as heavy drinkers, they conclude that young men who meet the criteria for alcohol dependence are in jobs that offer fewer major fringe benefits, are more dangerous, and are at smaller firms. In short, when asking the research question, "are men who are alcoholics in bad jobs?", it was difficult to control for confounding of many variables and make any conclusive statements about causality.

In many studies on women's drinking, most measures of alcoholism are derived from studies of male populations, thus limiting the applicability to female populations since women's drinking appears to be

qualitatively different from men in amount and consequences. Different measures for identifying at-risk women may be needed. For example, frequency of heavy drinking may be a more accurate indicator than classification into DSM=III-R categories.

Methods: This study uses data from the 1989 cohort of the National Longitudinal Survey on Youth (NLSY) which is unusually rich in information on labor force participation, earnings and other sources of income, household characteristics, health and mental health, smoking, drug and alcohol consumption. The sample is nationally-representative, with 12,686 youths between ages 14-21 in 1979. Of these, 6,283 were women. By 1989, 90% of the sample were still enrolled in the study. Variables used to classify drinking status only applied to participants who drank within 30 days of the NLSY interview. The sample used for this study excluded women who did not drink within 30 days as they could not be classified on drinking status,

Classification of Women's Drinking: In addition to assignments such as alcohol dependence or abuse based on DSM-III-R, which as previously discussed may be inadequate for identifying woman alcoholics and problem drinkers in public use surveys, this study used a measure of heavy drinking in women. This measure, the frequency of days in the month prior to the interview date when a female participant consumed more than six drinks, is correlated with the alcohol abuse/dependency indicator. In addition to the actual frequency of days on which six or more drinks were consumed during the previous 30 days, a binary indicator of heavy drinking was created. If the woman reported drinking six or more drinks on one occasion more than once during the 30 days prior to the interview, that was set to equal one. Otherwise it was set to zero. Using this criterion, 19% of the sample of employed women was classified as heavy drinkers.

Model of women's preferences for job characteristics: The authors ran probit regressions to determine the impact of alcohol dependence/abuse and heavy drinking on the probability of reporting a fringe benefit. These regressions were repeated using the frequency of heavy drinking as a predictor of having the fringe benefit. To control for possible gender differences in preferences for job characteristic, other variables were included in the model such as household attributes like marital status and number of dependents as these may influence a woman's preference for fringe benefits and other job characteristics.

Earnings and human capital formation: The authors acknowledge the possibility of confounding due to the indirect affect of alcohol on educational attainment. They conducted descriptive analyses with categorical comparisons of reported earnings by occupational choice. In addition, additional earnings regressions were conducted to examine the indirect effect of alcohol on educational attainment.

Results:

Fringe benefits: When frequency of heavy drinking is used as an indicator of problem drinking, the authors found strong negative effects for health insurance, life insurance, paid sick leave, and training or education opportunities. Coefficients in the childcare and paid vacation regressions are also negative and statistically significant. This effect is strikingly consistent across health insurance, life insurance, and paid sick leave with each drinking episode in the past month associated with a decline in probability of

having a job with these fringe benefits. The largest effect is on human capital enhancing benefits, where each additional heavy drinking episode per month is associated with a three-percentage point reduction in the probability of having a job with training or education benefits.

As previous researchers have noted, it is possible that low job quality and satisfaction "cause" the drinking episodes, and not the other way around with low job quality resulting from drinking. In this study, except for paid sick leave and childcare, past heavy drinking does not seem to have an effect on current fringe benefits. In addition, there is less evidence of a causal link between past drinking and current job characteristics among women than has been found for men. There is less evidence that past drinking has had a causal impact on current job characteristics among women than was found for men. Overall, drinking patterns found by this research were different from those found in previous cohorts of the NLSY.

Occupational choice: As previous research found, there seems to be no association between DSM-III criteria for abuse or dependency and these characteristics among women. However, there are statistically significant associations between frequency of heavy drinking and labor force participation. Each additional heavy drinking episode reduces the probability of holding a white collar job or being employed full-time by roughly two percentage points and increases the probability of not being in the labor force by one percentage point. Job satisfaction also declines with heavy drinking, while there is an increase in the probability that a woman is employed in a job where compensation is based on job performance.

Earnings: White collar alcoholic women working in professional/technical jobs or sales appear to earn more than their non-alcoholic peers. While these are not large differences, this trend has been confirmed by other studies. The same trend has been found among blue-collar women, with the largest difference in "operator" occupations, with alcoholic women in this occupation earning on average $4,000 more per year than their non-alcoholic peers. A similar trend was observed in service workers where alcoholic women earned roughly $1,400 more per year on average. However, this affect did not hold across past heavy drinking (1984 data) and current wage (1989), suggesting that the trend is not cumulative.

Human capital: The researchers sought to understand the extent to which human capital formation confounds the association between drinking measures and labor force outcomes. Results of regression analysis were that alcohol abuse/dependency, current heavy drinking, and past heavy drinking all have a negative and statistically significant association with years of schooling completed. Among abusers and dependents, alcoholism is associated with roughly a third of a year less school at the mean. Each heavy drinking episode per month was associated with a reduction in schooling of about one tenth of a year. Alcohol abuse and dependence was also associated in a significant increase in likelihood of never having married or being separated. Number of children was negatively associated with alcohol abuse/dependence. Overall, current heavy drinking and past heavy drinking were found be similarly associated with current levels of human capital but contemporaneous drinking is more strongly associated with lower human capital formation than past drinking.

Discussion: Most importantly none of the findings from this study imply a causal relationship women's drinking and job characteristics. More sophisticated methods would be needed to detect and measure a causal effect, such as structural model of alcohol consumption, schooling choice, and labor market participation.

Although this study found an association between drinking and job characteristics for women alcoholics and heavy drinkers, it differs from the association found among male drinkers. One of the most notable differences was between males and females who meet the criteria for abuse or dependence. Previous studies found alcohol dependence to be significantly and negatively associated with the probabilities of having several different employer-provided fringe benefits in males. With the exception of childcare, this study did not find evidence of such an association for female alcoholics and abusers. But for heavy drinking women, results were quite similar to those in men for benefits such as health insurance, life insurance, paid sick leave, and training and education opportunities.

The childcare and health insurance finding is notable: if working mothers who are heavy drinkers experience reduced access to health insurance nd reliable childcare, then in addition to direct negative effects of drinking on children's health and behavior there may be negative effects as well. This finding, and the evidence of direct negative effects of maternal drinking on children's health and behavior support the possibility that women alcoholics' productivity losses are not limited to the workplace but may also affect the production of child health. If this is true, failure to account for these trends could result in under-estimating true productivity-losses associated with alcoholism and heavy drinking in women.

In summary, heavy drinking appears to be negatively associated with both wage and non-wage compensation among women, although negative wage effects are greatly diminished when human capital measures are controlled.

14. Snow Jones, A., Gondolf E.W. (2002). Assessing the Effect of Batterer Program Completion on Re-assault: An Instrumental Variables Analysis. *Journal of Quantitative Criminology*, *18*(1): 71-98.

Background: Studies on program effectiveness are often limited by confounding factors such as unmeasured traits of compliers vs. non-compliers. This paper aims to create a model that accounts for these factors by using instrumental variables (IV) method to estimate effectiveness of batterer programs for participants who complete their assigned program. Estimates from the instrumental variables model are compared with estimates from a "naïve" model for assessing the effect of program completion on probability of re-assault.

Data description: The data used in this study came from four different sites representing range of intervention designs. There were 853 batterers and index partners enrolled, with 18% voluntarily enrolled (self-selected into it) and 82% mandated to participate. Because some enrollees were voluntary and some mandated, and the incentives were different across the four sites, these characteristics could weaken the findings such as rate of successful completers or efficiency of the program designs. Thus, instead of comparing simply completers to non-completers, a "naïve" approach, the researchers devised a more complex "structural model" that incorporates the correlation of different behavioral responses that are observed for the same individual.

Discussion: This analysis found some evidence that the naïve model produced biased estimates of the effect of program completion on re-assault based on large and statistically significant estimated correlation between two equations in the bivariate version. However, it does not appear that the instrumental variables method used produced any more reliable results than the naïve estimates.

Also representativeness of the sample is limited due to the inclusion of self selected voluntarily enrolled in program. While it may be common that some batterers self-enroll, the majority of participants do not, and have to be required.

Despite these caveats, the results from the bivariate probit indicate that among this group of men, program completions appears to reduce re-assault by roughly 40 percent. This reduction seems to be substantial and significantly larger than the naïve estimate of 15 points. If this effect were confirmed (using either IV methods with improved instruments or experimental data with randomized placebo controls), it would indicate that improved program retention among a select group of batterers who accept the "offer" of batterer program participation after sentencing or by self-referral could lead to significant reductions in the probability of re-assault at 15 month follow-up. Unfortunately it can only be interpreted as suggestive and worthy of further investigation. This relationship should be investigated further using methods that in other contests have provided more reliable estimates of program effects with quasi-experimental data than those obtained with IV methods. Nonetheless, the structural framework that lead to using the instrumental variables method is a useful point from which to conceptualize analyses with both quality experimental data and experimental data when non-compliance is an issue.

Conclusion: Non-compliers represent a group within studies creating a challenge for accurate assessment of program effectiveness. It is clearly a relevant factor in determining effectiveness when enrollment is not enforced.

A second recommendation for future research is to clarify program content. In this study, a full dose of treatment ranged from three to nine months. Results from this study seem to indicate that completion of any program, regardless of length will reduce reassault. However, from a policy perspective, this finding needs further investigation. IN general, shorter programs use fewer resources per batterer served. If it is the case that completion of three-month program leads to same reduction in reassault as completion of nine-month, this has major policy implications. In order to confirm this, future research should more accurately characterize and measure content of the difference programs being evaluated rather than simple binary indicator that all sessions of the program were attended.

Third, potential sources of selection bias in evaluation of batterer programs should be investigated. In quasi-experimental sample, there was strong evidence of selection bias such as stronger incentives for some participants to enroll and complete program compared to weaker requirements.

These three major threats to validity even a well-designed and well-executed randomized experiment, better study design alone may not mitigate these issues. Extensive literature on the analysis of quasi-experimental data is informative for ways to address these issues. Instrumental variables and matching methods such as nearest neighbor and propensity score methods can be viewed as examples of this approach.

In summary, this method was employed in the attempt to observe a causal relationship between program completion and re-assault not just the statistical association between the two outcomes. The authors employed methods appropriate for such jointly dependent outcomes. However, many caveats regarding these methods and the results of the methods raise questions about the validity of the findings. Thus, no policy recommendations could be made based on the findings. Although this method did not result in a successful model for predicting re-assault, this study can be used to make recommendations for future research.

15. Snow Jones, A, Gondolf EW. (2001). Time-varying risk factors for re-assault among batterer program participants. *Journal of Family Violence*, *16*(4): 345-59.

Background: Increased efforts to evaluate and refine batterer interventions have focused on indentifying indicators of reassault among batterers. Indicators of "most likely to reassault" batterers would be extremely useful in designing and targeting interventions more effectively in order to alter behavior and to protect partners.

Previous research on batterer programs has largely focused on personality characteristics and prior behavior. Possible "risk markers" that have been found to be associated with reassault include younger age, alcohol abuse, and narcissistic tendencies. More recently, experts point to situational factors such as availability of victim services and restricted access to the potential victim to prevent reassault. In addition, the well-documented presence of psychological and alcohol problems among batterers provides a basis for hypothesizing that availability and use of mental health and alcohol treatment services by batterers might further mediate against reassault.

Peer-reviewed literature on violent psychiatric patients indicates that reassaults may depend as much on "situations" co-occurring with or following psychiatric treatment (ie: time-varying) as they do on relatively stable (time-invariant) characteristics of the patient. This study uses a *dynamic* model of reassault that includes *both* time-varying characteristics that may be risk factors for reassault as well as time-invariant characteristics.

Methods: A total of 840 men were enrolled in this study after completing intake questionnaires at four geographically disperse batterer programs in Pittsburgh, Houston, Dallas and Denver. The four sites represented a range of well-established intervention systems.

Because the sample came from a relatively stable, large, multisite longitudinal database, meaning that variables for the same individual are measured at multiple intervals over time, observations on reassault and some risk factors vary over time. In most previous studies, data have been collected at only one point in time, thus yielding time-invariant measures of reassault and certain risk factors (ie: static specification). The time-varying characteristics included are both behavioral (such as drinking behavior or help-seeking behaviors which are believed to influence probability of reassault) and situational, such as unemployment, which also may influence reassault.

Participants and their "index" partner (the partner who experienced the assault that led to program referral) were interviewed by phone every three months for 12 months after intake. Data on reassault, other forms of abuse, employment status, living arrangements, contact between partners, substance use and abuse of the batterer, arrests, and use of additional services and treatment were collected at each follow-up interview. It is important to note that in programs that only lasted from 3 to 9 months, where follow-up was 12 months, reassault could have occurred during program participation or after dropout from or completion of the program. The sample was restricted to batterers who were referred to a program by the judicial system (82% of the batterer sample) to avoid influential characteristics from self-selection into battering programs. Also, by only including participants referred by the criminal

justice system, the analysis is more applicable to criminal justice system policy formulation as this is the primary way batterers are enrolled into the program.

Definition of time-invariant individual characteristics: Time-invariant individual characteristics, including "dispositional factors" (measured at intake), were used as markers for traits that are relatively stable over time and that may influence propensity to reassault. Measures of batterer's personality traits and alcoholic tendencies at program intake were included in an effort to control for these frequently unobserved personal characteristics believed to be associated with battering.

In addition, variables to control for unobserved batterer characteristics previously associated with reassault were included. Dummy variables for prior domestic violence and criminality were included. Three binary indicators of exposure to poor parenting were included to measure dispositional factors because evidence suggests that battering is transmitted inter-generationally. Finally, site-specific variables were included to control for time-invariant program characteristics and cultural norms particular to each site's geographic region, such as attitudes towards women or responsiveness of local law enforcement.

Definition of reassault and time-varying risk factors: The outcome variable varies over time. A "1" on this variable indicates the female partner reports that at least one reassault occurred during a follow up interval and 0 if otherwise. Reassault was defined by responses to items on the physical aggression subscale of the Conflict Tactics Scale (CTS; Straus, 1979) which has been used widely for assessing woman battering.

Predisposing risk factors that vary over time were used to report behavioral and situational indicators such as if the batterer was drunk at least once during follow-up interval or if the batterer was unemployed at follow-up. Mediating risk factors that vary over time are indicators of additional services obtained by batterers and their partners such as women's use of shelters, mental health, and other counseling services, use of legal protection, and the batterer's use of drug and alcohol treatment or mental health services.

Statistical analysis: Ordinarily, a binary dependent variable would be analyzed using logistic regression. However, because the data are longitudinal and consist of repeated measures on the same individuals, the assumption of independence of observations that underlies standard maximum likelihood estimation is violated. Instead of logistic regression, the Generalized Estimating Equation (GEE) method was used because the correlation between observations on the same unit is explicitly estimated and incorporated, producing consistent estimated standard errors.

Results: *Predisposing time-varying factors:* Of the predisposing time-varying factors, those relating to the batterer's drunkenness during a follow-up interval are associated with the highest risk of reassault. In one specification of the model, at least one drunken episode during the follow-up interval was associated with nearly three and a half times the risk of reassault than the contrast group (not characterized by drunkenness). In the second specification of the model, risk of reassault increased almost exponentially as frequency of drunkenness increased: those who draft almost daily were 16 times more likely to reassault. In both analyses, unemployment was not significantly associated with

reassault. Explanatory power of these models was quite good, especially for the "frequency of drunkenness" model which has significantly better explanatory power.

Mediating time-varying factors: Results indicate that receipt of alcohol or drug treatment services reduced probability of reassault by roughly 30-40%, but this effect is not significant at conventional levels.

Dispositional factors: Severe psychopathology doubles the risk of reassault in either specification of the model. A history of non-domestic violence arrest prior to program intake is associated with a 90% elevation in risk of reassault in one specification of the model but this effect diminishes in both magnitude and significance when the frequency of drunkenness is used instead of the binary indicator. None of the poor parenting dummy variables were significantly associated with reassault nor did they increase the explanatory power of the model.

Discussion: The most notable finding is that a time-varying indicator- any drunkenness or high frequency of drunkenness after program intake- is the strongest predictor of reassault. There is weak evidence that receipt of alcohol and drug treatment in the previous follow-up interval substantially reduces the probability of reassault. It should be noted that the failure of this effect to achieve statistical significance might be due in part to measurement error. This binary indicator represents batterer and partner response to questions about the use of inpatient outpatient residential and self-help programs. Little is known about the length of treatment or whether or not there was compliance with treatment protocols. Unfortunately any mediating influence from other services, interventions, and treatments was difficult to establish because of difficulty measuring when and how much these services were used. The pronounced relationship between drunken and reassault does not necessarily imply a causal link. We were unable to link drunkenness temporally to reassaults (ie: we don't know if an episode of drunkenness preceded, coincided with, or followed the reassault).

The value of these "drunkenness" markers is not only the magnitude of the risk associated with them, but also the fact that they are nonclinical indicators drawn from self or partner report. The information is straight forward to obtain, therefore offering a convenient cue for practitioners and potential victims.

Overall, the findings confirm the importance of measure both time-varying risk factors as well as more static, time-invarying factors of disposition or personality. Thus, assessing potential for reassault primarily through program intake may not be sufficient.

16. Snow Jones, A. (2000). The cost of batterer programs: how much and who pays? *Journal of Interpersonal Violence, 15*(6), 566-586.

Background/Introduction: While several studies have assessed the effectiveness of batterer programs, no studies have evaluated the cost-effectiveness of programs in terms of reducing the prevalence of domestic violence (DV). The cost of batterer programs is important for DV advocates, supporters of the programs and program funders. Some advocates of women's services have criticized funding for batterer programs which may divert much-needed funds for women's services. Yet funders want to support programs that are effective. Thus, it is vital that these programs be assessed using sound economic cost analysis.

This article discusses costs of four geographically and programmatically diverse batterer programs and illustrates the components and procedures of conducting a cost analysis. The data will enable economists to conduct cost effectiveness analysis (CEA) of batterer programs to learn which programs provide the most impact for the least money. This information is also useful to policymakers and program developers in understanding factors that influence cost and outcomes of programs.

Method: Instead of just calculating program accounting costs and operating costs paid for by the program, this analysis also includes the program's opportunity cost which includes the value society has to give up to have the program. This value includes costs that may not be paid for by the program such as volunteer labor, and use of public goods and services such as the criminal justice system or court costs of program participants paid for by taxpayer money.

Data: Data was collected from four batterer programs in geographically dispersed cities. The sites were selected to illustrate the variation in program designs despite each conforming loosely to established standards for batterer programs. The sites with the highest program costs were the ones with more full-time staff (Site 1) due to the costs of salaries and fringe benefits. Data were collected retrospectively from annual reports on the past fiscal year and costs were adjusted for inflation.

Sample: 210 men were recruited to participate, with the majority of men (82%) having been mandated to the program by the courts. Demographic characteristics reflected general trends of participants mandated to participate in batterer programs. The mean age was 32, the majority of participants were of low socioeconomic status, 55% were racial minorities, 24% had less than high school education, a third were unemployed or working part-time, and half did not live with their partners. Subsamples at each of the four sites reflected similar rates of prior records of partner abuse, previous arrest, history of alcoholic tendencies, and personal history of parental abuse and alcoholic parents. However, some minor differences among the four sites emerged: at Site 1, batterers were more likely to be of low socioeconomic status while Site 4 participants had higher SES. Site 1 participants were mostly court-referred (94%) while Sites 2, 3 and 4 only 77%-79% were court-referred. In the event that court-referred participants and participants of lower SES cost more to the program such as by requiring longer counselor time due to lack of motivation, these demographic factors could account for cost differences among the sites.

Calculated costs included those from personnel and daily operational costs, women's and children's' services that may be offered as part of the batterer program (for batterer's partners), court costs, and volunteer costs. Overall costs of the programs were calculated by dividing total site costs by total number of program participants at each site during fiscal year 1995 regardless of whether or not participants completed the program. Cost per batterer group was calculated by dividing the total cost figure by the number of sessions attended.

Results: Total program costs ranged from slightly more than $250,000 per year for two three-month programs at Sites 1 and 2, and slightly more than $500,000 per year for the more comprehensive nine-month program at Site 4.

Discussion: One striking finding was the low estimated cost of batterer treatment counseling sessions. Even after factoring in volunteer hours, the cost of a session at the sites which ranged from $22 to $32 per session was remarkably low. This could be partly due to the use of counselors hired as consultants not as full-time salaried staff which kept costs low. Yet these estimates for batterer counseling sessions were still lower than costs for comparable mental health services. After allocating all costs of the site programs, the cost per participant to complete the program was between $261 and $622, with three of the four sites costing a total of less than $400.

Conclusion: The batterer programs measures in this study are extremely affordable compared to the costs of alcohol and substance abuse programs which range from $473 to $6,800. It should also be noted that batterers themselves pay for a large portion of the costs of participation. One limitation of this analysis was the retrospective data collection. Future cost analyses should be conducted prospectively in order to identify and measure opportunity costs more accurately.

Above all, this analysis shows the importance and feasibility of including a cost analysis component when conducting future program evaluations. Future program evaluations of batterer program effectiveness should include a cost analysis component. Conducting better cost analyses will provide important insights into the ways in which program structure and scope of services impact cost and outcomes. Cost data can then be combined with effectiveness data to enable cost-effectiveness analysis (CEA).

17. Snow Jones, A., Astone, N.M., Keyl, P.M., Kim, Y.J., & Alexander, C.S. (1999). Teen Childbearing and Educational Attainment: A Comparison of Methods. *Journal of Family and Economic Issues 20*(4):387-418.

Introduction: Although there is a well-established correlation between teen childbearing and impact on secondary educational attainment, it is not clear if this relationship is a causal one. The literature supports the common belief that there is a correlation, with previous studies finding teen childbearing associated with reduced health for both mother and child, and low socioeconomic attainment later in life due to the high likelihood that teenage mothers have low education. However, most research on the consequences of early childbearing focuses on the relationship between early birth and educational attainment. These studies fail to distinguish between young women who desire higher education and those who do not. This difference in young women's preferences for schooling is either unobserved or poorly measured by researchers, leading to a spurious correlation between teen births and low educational attainment.

Clarifying the true relationship between teen childbearing and high school completion has important policy implications. If early childbearing really does interrupt high school education, then the prevention of early childbearing, which is the motivation for eliminating welfare support for early childbearing, should have the effect of increasing levels of educational attainment. If the presumed relationship between childbearing and high school completion is false, then reducing social support for teen mothers will have little or no effect on educational attainment or socioeconomic status.

Findings from previous research on this relationship have not been particularly robust. One reason for this is the problem of causal ambiguity in understanding relationships among self-determined behaviors, such as teen pregnancy. This problem is sometimes referred to as the "endogeneity" problem. Furthermore, prior studies that control for endogeneity generally find a smaller effect.

The following article has two aims: one is to describe several established methods for addressing research problems such as endogeneity and discuss their strengths and weaknesses. The second aim is to measure the effect of teenage childbearing on secondary school completion. The data set is especially fitting for this study because it provides longitudinal data on the participants and contains unusually rich measures of their engagement with school and potential for success in educational goals. Thus, this study can control for existing differences that previous research has been unable to address.

Methodological problems: Economists and sociologists have proposed models to measure the impact of early childbearing on high school completion. Economists tend to focus on the young woman's time allocation and opportunity costs of being a teenage mother due to the need for child care during school and study hours. Sociologists on the other hand emphasize the institutional environment of education, noting the difficulty of combining the two roles of student and mother. Although different approaches, both methods are based on the same causal link between birth and education attainment: they both focus on the situation brought about by the birth itself, which affects all teenage mothers, regardless of individual differences in their preferences for educational progress.

Teenage childbearing reflects several personal choices such as whether to become sexually active, whether to use birth control, and whether or not to carry an unwanted pregnancy to term. In addition, the choice to complete high school is also dependent on the girl's innate abilities, her interest in school, financial barriers to family planning services, health status and fertility, family expectations, peer norms, and her own preference for children. These individual tastes and preferences for schooling and childbearing are difficult variables to measure and may not be observable at all. If a teenage birth is the result of individual choice, the omitted confounding characteristics (unobservable or poorly measured factors) will bias the regression analysis of the effect of birth on outcomes that are choices potentially related to the same unobserved or unmeasured factors. When a regressor is correlated with an unobserved or poorly measure variable that is not included in the model but impacts the outcome variable (ie: a confounding variable), biased or incorrect regression coefficients will occur. This is sometimes referred to as an omitted variables bias.

Econometric estimation: This study discusses three different ways of conceptualizing the relationship between teen birth and high school completion. The first is a superficial estimation of the relationship between teen birth and high school completion. A "naïve model" was used, treating teen pregnancy as if it was randomly assigned and measured as if it were an external determinant of high school completion. The results of this initial method serve as a baseline comparison for the more sophisticated two methods.

Next, two sophisticated models were used to which take into account unobserved variables which may influence the relationship. Examples of unobserved (omitted) variables include: intelligence, career aspirations, peer attitudes, cultural norms and individual and family tastes and preferences for childbearing. Observed variables include: demographic characteristics, family socio-economic status, parent education, available sex partners, religious beliefs, local welfare services, labor market conditions, legal school drop-out age, and availability of family planning services.

The first, called a bivariate probit model assumes that the underlying, unobserved factors that may influence childbearing and education are only observed when some threshold value is crossed and the individual becomes a teen parent or completes high school. A slightly different version of this model, called the two-stage probit is used if teen pregnancy is correlated with high school completion in two ways, not one. The first is through unobservable characteristics including a teen's propensity to become pregnant and give birth and her propensity to complete high school. The second way is through the effect of teen pregnancy on the opportunity cost of time spent in acquiring a high school degree.

The second method, called a multinomial logit model, is more straightforward and may provide more relevant information to policy considerations than the previous two methods discussed. It also may be better able to overcome the problems of estimating two inter-related relationships. In this method, outcomes are redefined into four mutually exclusive categories: a) no teen birth/graduated high school or GED; b) teen birth/graduated high school or GED; c) no teen birth/did not graduate high school or obtain GED; and d) teen birth/did not graduate high school or obtain GED. By redefining outcomes this way, there is only one equation to measure, eliminating the concern over the correlation between two equations. Unfortunately this method does not provide a direct estimate of the impact of teen birth on

high school completion. However, it provides an excellent method for assessing the impact of policy relevant variables, such as availability of family planning services and government welfare policies on the two outcomes of interest while avoiding the methodological problems already discussed.

Study population and data: This study used data from the High School and Beyond Study (HSB) which is part of a twenty-year research effort in which four cohorts of American students were followed through their adolescent and early adult years: high school seniors in 1972, high school seniors in 1980; high school sophomores in 1980; and eighth graders in 1988. Tracking these four groups enables both within and across cohort comparisons about determinants of success in school.

Results: All three models used were consistent in terms of both the direction and magnitude of the estimated effects of childbearing on educational attainment. African American teens are more likely to complete high school regardless of teen childbearing status. Living with only one biological parent and no stepparent significantly decreases the probability of completing high school. High school dropout rates have a significant effect in the expected direction. Regional norms also play an important role in teen sexual behavior and educational outcomes. Girls in rural regions appear to be at risk of not completing high school even when there is no teen pregnancy. Mother's education and girl's educational attitudes and behaviors appear to have the greatest impact regarding whether or not a teenage girl completes high school. Family structure seems to play a consistently significant role among teens that have a child regardless of education status. Regional and rural effects and individual and family effects were significant but need further investigation. If regional and rural effects persist for example, it might be better to direct resources to increasing young women's educational attainment regardless of childbearing status in these areas. Targeting resources to improve educational attainment may be more beneficial for these young women than providing resources for preventing teen pregnancies.

Discussion/Conclusion: One objective of this study was to address the difficulty of measuring whether secondary education would improve if interventions were successful in decreasing early childbearing. All three models used in this study found similar results indicating that more sophisticated models may not be necessary to measure this. The bivariate probit and the multinomial logit results suggest that the teen fertility and educational attainment decisions may be separable. If this is the case, then it may be more meaningful from a policy perspective to investigate the effect of various policy instruments on high school completion rather than to estimate the effect of teen birth. For example, availability of contraception in high schools and resources targeted at improving school performance and attitudes are possible policy instruments.

With better measures of such policy instruments it may be possible to obtain direct evidence for the effects of these interventions on teenage girls' educational attainment Another advantage of this approach is that it can be done without resorting to two-stage methods, which often yield imprecise estimates. Such a strategy could not be employed with the data set that was used because identified geographic areas were too large to construct meaningful measure of local policy instruments. However, future research should investigate such models.

18. Snow Jones, A., Gielen, A.C., Campbell, J.C., Schollenberger, J., Dienemann, J.A., Kub, J., O'Campo, P., & Wynne, E.C. (1999). Annual and Lifetime Prevalence of Partner Abuse in a Sample of Female HMO Enrollees. *Women's Health Issues*, *9*(6): 252-261.

Background: Research has consistently found high rates of intimate partner abuse in the general population. Studies have also found high prevalence of abuse among women using primary care and emergency care clinics due to injury and their health problems associated with partner abuse.

Methods: 10,599 female HMO enrollees between ages 21 and 55 in the Washington DC area were sent a letter about the study, without mentioning partner abuse. 1,476 women responded and a final sample of 1,138 agreed to be interviewed by phone. The sample was largely African American and white women with a small percentage of Latina and other minorities, proportions that were representative of the racial populations of the Washington D.C. area. More than half the women made more than $50,000 per year. Notably, health care providers might expect this population to be at reduced risk of IPV due to the sample being a highly educated middle-class group of working women. Two measures of abuse were used, based on responses to questions from a modified version of the Abuse Assessment Screen (AAS). Unlike the AAS which asks questions about emotional and physical abuse in the same question, participants in this survey were asked about these two types separately.

Results: Overall, the sample reported lifetime prevalence of 37% of physical and emotional abuse. Women in their thirties reported the lowest prevalence (30.2%), while women in their forties reported the highest (42.2%). White women reported the lowest prevalence of physical and/or sexual abuse (27%) while African American women reported the highest (47%). Divorced or separated women had a high prevalence of intimate partner violence (60%) which is unsurprising as abuse is often either a cause or result of marital failure. With participants' increased education levels, the prevalence of abuse decreased: women who had more than four years of college reported significantly less lifetime prevalence (23%) than women with less than four years of college (42% - 49%) ($p=.001$).

With regards to annual prevalence of abuse, women in their twenties reported the highest annual prevalence of physical or sexual abuse. Annual prevalence of physical or sexual abuse trends downward with age. Similar to lifetime prevalence, African American women reported more than twice the rate of physical or sexual abuse as white women ($p <.01$). Similarly, widowed participants have the highest annual prevalence while married women have the lowest ($p <.001$). While there was a trend of decreased lifetime prevalence with increasing education level, the same trend is not the case for annual prevalence except for women in the highest education category. Interestingly, unemployed women have the lowest annual prevalence of physical or sexual abuse.

Overall, women with household incomes between $30,000 and$50,000 seem to be at highest risk of recent abuse. There is also a striking difference in annual prevalence between the two lowest income groups and the two highest ($p<.005$).

Discussion/Conclusion: The finding of this sample's lifetime prevalence estimate of 37% is consistent with the prevalence rate found by other primary care clinical samples. This sample's lifetime prevalence estimate is somewhat higher than most population-based surveys. However, unlike those surveys, this

sample is highly educated and financially well-off. This sample includes women who are presumed to be at low-risk of abuse yet these participants have lifetime prevalence rates similar to those of women who are not as well off. This indicates that violence is not limited to disadvantaged women. Furthermore, a larger portion of women than may be expected are at risk of abuse at some point in their life.

This study indicates that education is the most important characteristic in reducing risk of partner abuse. It is even more protective than the higher income often associated with higher education. Future research should be focused on illuminating the role of education in reducing risk of partner abuse.

19. Snow Jones, A., Miller, D., & Salkever, D. Parental Use of Alcohol and Children's Behavioral Health: A Household Production Analysis. *Health Economics, 8*(8):661-683.

Introduction: A Congressional report issued by the Office of Technology Assessment stated that the prevalence of alcoholism and alcohol abuse among adult men and women (up to 15%) suggests that parental alcoholism is one of the most common hazards to children's mental health. The report stressed the harmful effect of alcoholism in impairing parents' ability to effectively care for their children. Alcoholism is also associated with other family problems, such as divorce, domestic violence, and frequent life changes that also place children at increased risk of physical injury and mental illness. The already large number of children estimated to be living with alcoholic parents (7 million) is expected to increase.

Children's adverse health outcomes from parental alcohol abuse have been widely documented. Negative outcomes include higher levels of medical services, impaired cognitive and psycho-physiological function, higher rates of injuries and emotional problems. However, most of these prior studies rely on small, clinical samples, thus limiting the generalizability of these findings. Minimal research has addressed affective problems in children of alcoholics (COAs), but growing evidence suggests that these problems may be prevalent in this group.

Sample: This study uses data from the 1988 National Health Interview Survey (NHIS), which is based on a nationally representative sample of over 40,000 households in the US, to examine the effects of both heavy and problem drinking as well as moderate or light parental drinking on children's behavioral problems.

The 1988 NHIS included a child health supplement administered to the mother or caregiver of randomly selected child from each household in the survey. In addition, an alcohol supplement was administered to a randomly selected adult in each household. Data from the intersection of the two supplementary surveys were analyzed. The study sample was divided into two groups: one group of families in which the mother was the respondent to the alcohol supplement. The other included families in which the father was the respondent. Generally, the groups were similar on most characteristics.

Methods: The impact on children's behavioral health is measured using the Behavior Problems Index, a 32-question assessment. It is derived from the broader, more comprehensive instrument called the Child Behavior Checklist (CBCL), developed by Achenbach and Edelbrock.

Behavioral Health Production Function: Production functions are used to measure an output given certain combinations of inputs. Inputs include parental human capital, parental time input, measures of child's health service use, and measures of parental alcohol use. The latter input, parental alcohol use, may influence the health production process in many ways. For example, parental drinking may be associated with reduced productivity of parental time inputs into child health production such as abusive parenting or impaired parental judgment. Or use of alcohol may be correlated with less time spent in child health production.

Two alternative measures of behavioral health of children are used: a score for internalizing problems and a score for externalizing problems. Internalizing behavior includes feeling worthless or inferior, feeling depressed, stubbornness or irritability, easily confused and seems to be in a fog. Externalizing behavior includes bullying or being cruel to others, breaks things on purpose, disobedient at school, argues too much, irritability, complains no one loves him/her, sudden mood changes, demands a lot of attention, is not liked by other children, has trouble getting along with others, acts impulsively.

Variables used as inputs in the behavioral health production function are limited by the data available in the 1988 NHIS.

Parental Alcohol Use Measures: The Alcohol Supplement survey was used to compute the period during the child's life in which the parent who responded to the survey was consuming at least 12 drinks per year. This computation was used to define 'exposure' variables that measure the fraction of the child's life that the parent met this consumption threshold.

Econometric methods were used to account for weak variables or missing variables in conducting this analysis. Unmeasured factors such components of child health, parental psychological factors, unobserved stress associated with raising a child with behavioral problems may affect parental decisions about input quantities. Since these are unmeasured, this results in an omitted variables bias because detailed information on parenting practices and time inputs are rarely collected in general population surveys. Therefore, two-stage least squares (TSLS) methods can be used to estimate health production functions if instrumental variables are available. To estimate health production function, exogenous variables (price, non-earned income) can be used to indicate constraints on the family's allocation of resources.

Results: Tables 1 through 8 show regression results for various combinations of paternal and maternal alcohol inputs and different dependent variables. All combinations were measured using both OLS and TSLS models, and results were compared and discussed.

Conclusions: The results provide consistent evidence that parental alcohol use is an input with negative marginal product in the production of child behavioral health, regardless of which parent drinks. The magnitude of the effect is generally larger in the TSLS specification. The differences in magnitude between the TSLS and OLS estimates suggest that TSLS estimates may be less biased than OLS estimates. While our point estimates are somewhat imprecise, we are fairly confident that the effect of parents drinking on child behavioral health is negative and possibly larger than that indicated by the ordinary least squares coefficients.

Strong evidence emerged of relationships between some family structure variables and physical health and child behavioral health. The latter finding is noteworthy given that two different measures of parents' heath status were included in the regressions. There is high correlation between the parents reported health status and number of reported health conditions, giving rise to collinearity. However, despite this collinearity, the number of reported health conditions consistently influence child behavior problems.

While standard measures of parental inputs are not significant, there is evidence that children in households where marriage of biological parents is intact are at lower risk for behavior problems. Because these variables may proxy other parental or family characteristics such as emotional maturity and stability, it is difficult to interpret these results. However, they provide policy-makers, service providers, teachers, and clergy with a reliable way of detecting children who may be at high risk and should be targeted when creating intervention programs. Within the limits of data used, it would be difficult to develop better estimates of the relationship between child behavioral health and other aspects of parental behavior, parental time inputs, parenting strategies and use of preventive and treatment services. However, investigation of these factors is warranted based on the results of this study.