Published in final edited form as:

J Prim Prev. 2014 February ; 35(1): 13–20. doi:10.1007/s10935-013-0330-3.

Opportunity Costs and Financial Incentives for Hispanic Youth Participating in a Family-Based HIV and Substance Use Preventive Intervention

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Abstract

This paper presents results from a pilot study of the synergies between the opportunity costs incurred by research participants, participant compensation, and program attendance in a family-based substance use and HIV preventive intervention for Hispanic adolescents in Miami-Dade County, Florida. To estimate parent/caretaker cost per session and cost for the duration of the intervention, we administered the Caretaker Drug Abuse Treatment Cost Analysis Program (Caretaker DATCAP) to a random sample of 34 families who participated in a recent clinical trial of *Familias Unidas*. The total opportunity cost per parent/caretaker was under \$40 per group session, under \$30 per family session, and just over \$570 for the duration of the intervention. Participants were compensated between \$40 and \$50 per session and attended more than 79% of family and group sessions. Parents and caretakers incurred a cost of approximately \$30–40 per intervention session for which they were adequately compensated. Attendance was very good overall for this group (>79%) and significantly higher than attendance in a comparable uncompensated study group from another recent *Familias Unidas* trial that targeted similar youth. Findings suggest that incentives should be considered important for future implementations of *Familias Unidas* and similar family-based interventions that target minority and low-SES populations.

Keywords

Opportunity cost; Financial incentives; HIV/drug use prevention; Caretaker cost

Introduction

High rates of substance use and sexually transmitted infections such as HIV among Hispanic adolescents present serious public health challenges. According to the Centers for Disease Control (CDC) and Prevention's latest HIV Surveillance Report (2011), the rate of new HIV infections in Hispanic adolescents was 0.3 for 13–15 year olds and 10.3 per 100,000 for 15–19 year olds. This can be compared to the respective rates in Whites of 0.1 and 2.4 per 100,000. Furthermore, 10.1 percent of Hispanics aged 12 and older report substance abuse or dependence, as compared to 9.0 percent of Whites and 8.8 percent of Blacks (Substance Abuse and Mental Health Services Administration [SAMHSA], 2010). A number of studies

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have shown that culturally sensitive, family-based interventions reduce adolescent substance use and risky sexual behavior (Dishion, Kavanagh, Schneiger, Nelson, & Kaufman, 2002; Pantin et al., 2003; Prado et al., 2007). Very little research, however, has examined the costs associated with family-based substance use and HIV prevention, and no studies have estimated the indirect costs incurred by adolescents' parents and other caretakers who participate in these programs.

Whereas cost analyses traditionally provide detailed information on program resources and associated expenses, almost nothing is known about the full opportunity costs of the program and, in particular, the participants' investment of time, travel costs, and other resources. The opportunity costs to participants represent the personal resources and time they invest in intervention participation that could have been used for other purposes (e.g., the invested time could have been used for personal leisure, or the invested travel money could have been spent on food). For family-based interventions, the time and other resources that parents and caretakers are required to invest could be significant and perhaps prohibitive, especially for a prevention or treatment modality delivered over multiple sessions.

Other program and individual factors such as limited availability, waitlists, client relationships with therapists, restrictions on the number of sessions covered by insurance, and even more fundamental factors such as the individual's motivation for seeking help also impact participation and engagement in a program or intervention (e.g., Kadzin, Holland, & Crowley, 1997; Gates, Copeland, Swift, & Martin, 2012). However, in national surveys of substance use, treatment need, and treatment utilization, the cost (or perceived cost) of services is consistently reported as one of the top reasons for not pursuing treatment (SAMHSA, 2010). Estimating the costs incurred by intervention clients is therefore critical for understanding potential barriers to participation, especially among minority and low socioeconomic status participants, which can help intervention administrators and policy makers improve access to and engagement in prevention programs (Prado, Pantin, Schwartz, Lupei, & Szapocznik, 2006).

We examined the synergies between the opportunity cost incurred by research participants, participant compensation, and program attendance in a family-based substance use and HIV preventive intervention for Hispanic adolescents in Miami-Dade County (*Familias Unidas*). We report the results of a pilot study of the Caretaker Drug Abuse Treatment Cost Analysis Program (Caretaker DATCAP; French, 2005), which estimated the costs incurred specifically by parents and caretakers participating in *Familias Unidas*. We examine whether financial incentives established by study investigators adequately compensated parents for the time and other resources they invested in attending the intervention, and how these factors influenced engagement in terms of the number of group and family sessions attended.

Background

Cost studies in the substance abuse treatment and prevention literature typically evaluate the direct expenditures of resources used to deliver a treatment program or intervention. Such analyses exclude opportunity costs, which represent the full value of all resources used by the program, regardless of who paid for them (e.g., donated or subsidized resources, client costs). While direct expenditures may be of interest to providers in fiscal planning, opportunity costs are more suitable for economic evaluation because society at large shares in the benefits of substance abuse prevention and treatment.

In the early 1990s, French and colleagues developed the program DATCAP, a standardized data collection instrument and interview guide designed to estimate the costs of substance abuse treatment and related interventions (French, 2003a, 2003b; www.datcap.com). Because the DATCAP organizes cost data across standard categories of resources (i.e., personnel, buildings and facilities, supplies and materials, and miscellaneous), it can be used for other types of interventions including substance use and HIV prevention programs.

The DATCAP features a six-tiered approach based on standard economic concepts and principles (French, Dunlap, Zarkin, McGeary, & McLellan, 1997). These include (1) the use of a single measurement perspective that is flexible, standardized, and widely supported (opportunity cost); (2) the adoption of a single analysis perspective that is workable, standardized, and policy driven and that can be utilized with both treatment and prevention programs; (3) the isolation of a fixed set of cost categories that are consistent with standard economic theory and used in comparable studies; (4) the development of a standard set of questions for deriving cost estimates within each category; (5) the proposal of a relatively narrow range of acceptable sources for the resource use and cost data that will be used to calculate the estimates; and (6) the implementation of a consistent method for estimating costs for each category of data used. The DATCAP includes client and caretaker versions for the purpose of estimating the specific costs incurred by intervention clients and their family members. The DATCAP has been successfully applied to a variety of interventions such as methadone maintenance programs, family-based treatment for adolescents with substance use disorders, recovery management checkups, outpatient drug-free programs, drug court programs, prison-based treatment, short and long-term residential programs, and employee assistance programs (Bradley, French, & Rachal, 1994; Bray, French, Bowland, & Dunlap, 1996; Dennis, French, McCollister, & Scott, 2011; French, Dunlap, Zarkin, & Karuntzos, 1998; French et al., 1997; French & McGeary, 1997; McCollister, French, Inciardi, Butzin, Martin, & Hooper, 2003; McCollister, French, Prendergast, Hall, & Sacks, 2004; Roebuck, French, & McLellan, 2003).

We developed the Caretaker DATCAP in 2005 to estimate the financial burden imposed on parents and other caretakers of adolescents participating in substance abuse treatment and related programs. The instrument is currently available in both English and Spanish language versions. We designed the Caretaker DATCAP to be brief and flexible, and to be completed in about 20 minutes. The first section of the instrument collects background information from the survey administrator (name of program, program type or modality [e.g., prevention or treatment], mode of administration, and date) and the respondent (relationship to adolescent, adolescent's previous treatment episodes, health insurance, occupation and income, and zip code of primary residence). The survey collects information on cash and in-kind payments, time investment, out-of-pocket transportation costs, and any additional expenditures associated with participation in the intervention. A brief description of each cost category is presented in the Methods section that follows.

Methods

We conducted the Caretaker DATCAP pilot study in August and September of 2009. *Familias Unidas* is a Hispanic-specific family-based intervention designed to prevent or reduce adolescent problem behaviors including substance use and risky sexual behaviors (Pantin et al., 2003). Intervention staff work directly with parents to improve awareness, promote communication, and provide them with necessary skills to effectively raise adolescents in the United States (Pantin et al., 2009). The intervention is conducted over four months, during which time parents attend nine 2-hour group sessions and ten 1-hour family sessions that include the adolescents. After completing the intervention, families also attend up to four 1-hour booster sessions provided every six months. *Familias Unidas* has

been evaluated in three randomized control trials, all school-based, in which the content of the intervention was the same but the dosage in terms of number of intervention sessions varied, as did the comparison conditions. Across all trials, *Familias Unidas* has been shown to be efficacious relative to a community control condition in improving family functioning and reducing substance use and unsafe sexual behaviors (Pantin et al., 2009; Pantin et al., 2003; Prado et al., 2007; Prado et al., 2012).

For the Caretaker DATCAP pilot study, we randomly selected and recruited 34 families who participated in the second randomized clinical trial of *Familias Unidas*. The original sample in the clinical trial study included 213 families, of which 109 were randomized to *Familias Unidas*. Thus, the pilot study included 31% (34/109) of the original intervention sample. The majority of pilot subjects had lived in the U.S. more than 10 years (72%); about 7% had resided in the U.S. less than 3 years. Eighty-six percent of the families had annual incomes less than \$30,000. We interviewed one representative caretaker (85% of the time the mother; 15% of the time the father) about the costs incurred while participating in *Familias Unidas*.

Caretaker cost categories

Cash or in-kind payments—The first set of questions in the Caretaker DATCAP asks participants to report whether they made cash or in-kind payments for the child's participation in the intervention. The instrument notes specific examples of in-kind contributions to guide caretakers in answering the question (e.g., volunteering their time or donating supplies). We then asked caretakers to record the type of payments, how often they made payments (e.g., one lump sum, weekly, monthly), and their exact or approximate value.

Transportation costs—Participants also reported round-trip transportation costs, including money spent on gas, public transportation, or a taxi service, to travel to an intervention session. We calculated transportation costs as a per-session travel cost, which can then simply be multiplied by the number of sessions in the intervention to obtain an estimate of total transportation cost over the duration of the intervention. For caretakers who did not report any direct travel costs (usually because they expressed difficulty estimating these values), we multiplied the number of miles traveled to the intervention by the average transportation cost per mile (U.S. Department of Transportation, Bureau of Transportation Statistics, 2009).

Time Costs—The opportunity cost of a caretaker's time includes both the time spent to travel to the intervention and the time spent in intervention activities. For these calculations, we assume that participating in the intervention encroaches on both work and personal (i.e., leisure) time. We assessed the cost of participants' time using their hourly wage, or an approximation for salaried workers, and multiplied by the duration of an intervention session. Group sessions typically lasted two hours, while family sessions lasted one hour. For participants that reported not working at the time of the intervention, we assigned the Florida State minimum wage of \$6.15 per hour to estimate their time costs. This approach is appropriate given that the majority of caretakers participating in *Familias Unidas* are legally able to work in the U.S. and the minimum wage represents a lower bound on the value of lost productivity.

Miscellaneous costs—Participants also reported additional opportunity costs related to childcare, time spent during phone calls with intervention facilitators, and other extraneous costs attributable to participation in the intervention. As with cash or in-kind payments, caretakers reported the type of obligation or cost, how often they incurred this burden, and its approximate financial value. For each cost category and for total cost, the Caretaker

DATCAP estimates the average cost per session and the total cost over the duration of the intervention.

We conducted Caretaker DATCAP interviews by telephone in August and September 2009, and paid respondents \$30 for completing the survey. We selected this amount based on the expectation that respondents would need to work with survey administrators to estimate complex figures such as expenditures, travel distance, and time invested in intervention activities. The average duration of the Caretaker DATCAP interviews was 20 minutes. For each cost category and for total cost, we summarize, in 2009 dollars, results as the average (per family) cost per session and the total (per family) cost over the duration of the intervention. Due to small errors within the data, we were unable to calculate the costs related to three participants and so excluded them from analysis.

Attendance and compensation data from the clinical trial—We compared parent/caretaker cost data from the pilot subjects to their compensation and attendance data obtained from the main study (Pantin et al., 2009). While parents and caretakers were participating in the *Familias Unidas* intervention, they were paid \$10 per hour (roughly equivalent to their average hourly wage of \$10.17) plus an additional \$30 for travel expenses. Participants were therefore compensated \$50 for group sessions (lasting two hours) and \$40 for family sessions (lasting about one hour).

We also examined participation data from a separate efficacy trial of *Familias Unidas* (Prado et al., 2012) in which data were collected and analyzed in 2010–2011, and families were not compensated for their participation. Due to slight differences in the number of family and group sessions between the two trials, we converted attendance data into a percentage of family and group sessions attended out of the total number of sessions possible in each category. We compared attendance data between the two trials using a two-sample Wilcoxon Rank-Sum test. In both trials, the efficacy of *Familias Unidas* was evaluated relative to a Community Practice condition in preventing HIV risk behaviors and substance use. The University of Miami Institutional Review Board approved all study procedures including data collection and analysis, and all study participants provided written informed consent.

Results

Table 1 shows that the average total opportunity cost per family was \$27.90 per family session, \$38.07 per group session, and \$571.57 over the duration of the intervention. Total opportunity cost was comprised primarily of time (73%) and transportation (18%) cost. On average, parents and caretakers traveled 17.48 miles round-trip to attend each session, spent approximately 30 minutes travelling, and spent about \$5.50 in out-of-pocket transportation costs. Other costs incurred by parents and caretakers over the duration of the intervention included lost work time (\$42.92), childcare costs (\$49.35), and time spent in phone conversations with intervention facilitators (\$27.84). Additionally, one parent reported an out-of-pocket \$300 psychiatric consultation cost associated with intervention participation.

Participants attended an average of 8.8 out of a possible 10 family sessions (88% attendance rate) and 7.1 out of a possible nine group sessions (79%). We compared these attendance rates to the most recently completed trial of *Familias Unidas* (Prado et al., 2012), which targeted a similar sample of Hispanic problem youth and their families but did not provide compensation. Session attendance was much lower for this latter sample, in which participants attended a total of 3.9 out of a possible eight group sessions (49% attendance rate) and 3.0 out of a possible four family sessions (75% attendance rate). Attendance rates to group sessions differed significantly across trials, with the uncompensated group of

participants attending fewer group sessions ($p < .001$). The uncompensated group also attended fewer family sessions, but results were not statistically significant ($p = .77$).

Discussion

Study results show that parents and caretakers incurred a cost of approximately \$30-\$40 per session (\$571.57 over the duration of the intervention), for which they were adequately compensated. Attendance across all sessions was high overall for this group (>79%), suggesting that providing financial incentives could be important for future implementation of *Familias Unidas* and similar family-based intervention programs. The comparison in attendance rates between compensated and uncompensated families highlights the synergies between opportunity cost, research participant compensation, and intervention engagement. Uncompensated participants attended approximately half of the required group sessions.

Recommending that service providers pay families or individuals in need of therapeutic or behavioral interventions obviously raises questions regarding the ethics and cost-effectiveness of offering financial incentives to patients, treatment clients, or intervention participants. In the substance use disorder treatment field, for example, there is a growing consensus among treatment experts that contingency management (CM) protocols (i.e., offering clients rewards such as vouchers and prizes for maintaining abstinence and meeting program goals) should become a standard component of treatment (e.g., Kellogg and Kreek, 2006; Roll, 2007). The overall feasibility and potential financing mechanisms for doing so, however, remain unclear. Part of the uncertainty, which is relevant to both treatment and prevention initiatives, concerns how improved engagement with a program offering financial incentives will translate into better outcomes – and thus potentially lead to cost-savings. Understanding the costs and benefits of preventive interventions featuring CM is an important next step for the prevention science field. If cost-savings to intervention providers are demonstrated using data from randomized effectiveness trials, the feasibility of incorporating CM into prevention programs can be supported further, and potentially tied to recommendations for revised reimbursement rates for these services. These are complex questions that we hope to explore in an ongoing study of *Familias Unidas* as well as in future planned studies of the same intervention.

Limitations

We note a few limitations to our study. First, the analysis sample for the pilot study was small ($N = 31$), and results may not be generalizable to all *Familias Unidas* participants. Second, participants reported costs retrospectively (from as far back as 2 years prior to the intervention) and recall bias may have led to inflated and/or underestimated costs. Survey administrators attempted to minimize this potential source of bias by helping participants remember specific details about their experience in *Familias Unidas* such as how the intervention was structured, typical weekly activities, the location for group meetings, and public transportation options. Third, only one representative caretaker was interviewed for the pilot study, and although we asked him or her to report any costs incurred by other family members participating in the intervention, we do not know the extent to which these additional costs were accurately assessed and included. However, we note that proxy reporting is common in national surveys as a way to minimize respondent burden and data collection costs (e.g., National Health Interview Survey Factsheet from the National Center for Health Statistics, 2013; Current Population Survey from the U.S. Census Bureau, 2013). The potential under- or over-reporting of outcomes as a result of this approach must be noted as a potential limitation.

Fourth, the opportunity cost of missed work time is typically valued using an individual's rate of pay (Pauly et al., 2002), but valuing leisure (non-work) time is more challenging and

controversial, and has been the subject of numerous theoretical and empirical studies over the past four decades (e.g., Becker, 1965; Feather & Shaw, 1999; Heckman, 1974; Moffitt, 1982; Propper, Croxson, & Shearer, 2002; Tranmer, Guerriere, Ungar, & Coyte, 2005). Lacking any clear consensus regarding the preferred method for valuing leisure time, we valued participants' time at a constant rate reflecting reported or projected earnings as described above.

Fifth, the distribution of caretaker cost data was somewhat skewed, and the median cost estimates per family and group session (\$20 and \$29, respectively) and per episode (\$444) may therefore present a conservative view of parent/caretaker costs. Finally, we were not able to explore in a multivariate analysis all of the key factors that predict attendance across both *Familias Unidas* samples. The uncompensated sample (Prado et al., 2012) shared many of the same background characteristics as the compensated (current) sample, but they differed on measures of parents' work status. The compensated sample had a higher proportion of full-time work (56% vs. 39%) whereas the uncompensated sample had a higher proportion of unemployed or laid-off parents (17% vs. 8%). It is possible that these differences in work status, and not lack of compensation, may have driven the differences in attendance noted between the two groups. For instance, unemployed individuals may actually have less flexibility to participate in intervention activities if they are actively seeking employment and/or taking odd jobs to make money. These limitations aside, this study represents an important first step in understanding the financial burden and other constraints that are associated with participation in family-based interventions, and thus extends the basic discussion of compensation versus coercion.

The results of this study are useful for multiple stakeholders. Direct intervention costs provide necessary information for economic feasibility analyses and implementation studies (Dennis et al., 2011; McCollister & French, 2002). For family-based interventions requiring input and participation from parents and caretakers, however, such cost data do not provide a full economic assessment from the family's perspective. A better understanding of the financial burden imposed on caretakers could motivate prevention administrators and public health practitioners to make adjustments in intervention hours, or provide standard vouchers or other compensation to help minimize or offset these parent/caretaker costs. Given the well-documented link between program participation and positive outcomes, understanding and effectively addressing the costs of program participation incurred by parents and caretakers could greatly enhance the effects of the program and thus prove extremely beneficial to society.

Acknowledgments

Funding for this study was provided by the National Institute on Drug Abuse (R01 DA025894; R01 DA 017462; R01 DA031785). We are grateful to Maria Tapia for facilitating the pilot study, Gisele Leon-Jiminez and Meghan Calfee for conducting phone interviews, and to the *Familias Unidas* families who agreed to participate. We are also grateful to Shi Huang, Carmen Martinez, and William Russell for research support and editorial assistance.

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Table 1Summary of Parent/Caretaker Costs Associated with the *Familias Unidas* Intervention (in 2009 dollars)

Variable	Cost per session (SD)	Cost over duration of intervention (SD)
Session time (family/group) ^a	\$10.17/\$20.34 (5.74/11.48)	\$258.61 (158.73)
Travel time	\$5.16 (3.50)	\$87.35 (64.67)
Transportation cost	\$5.63 (3.90)	\$95.82 (77.77)
Phone time	\$1.63 (2.60)	\$27.84 (49.23)
Time lost from work	\$2.40 (9.40)	\$42.92 (166.79)
Childcare	\$2.90 (11.31)	\$49.35 (208.18)
Miscellaneous costs ^b	\$0 (0)	\$9.68 (53.88)
Total	\$27.90/\$38.07 (19.66/22.92)	\$571.57 (409.39)

SD = Standard deviation.

^a Only difference in cost between group and family sessions was actual time spent in the session. Group sessions lasted two hours and family sessions lasted one hour. Group and family sessions were conducted in identical locations. This minor difference is reported in session time and total costs per session. The session time costs for family and group sessions are added together when reporting cost over the duration of the intervention.

^b Only one parent reported incurring a “miscellaneous” cost associated with the intervention (\$300 for a psychiatric evaluation). This was factored into the cost over the duration of the intervention but was not relevant for the cost per session calculations.